Q22 ORDER NO. SD83082626C2

Service Manual

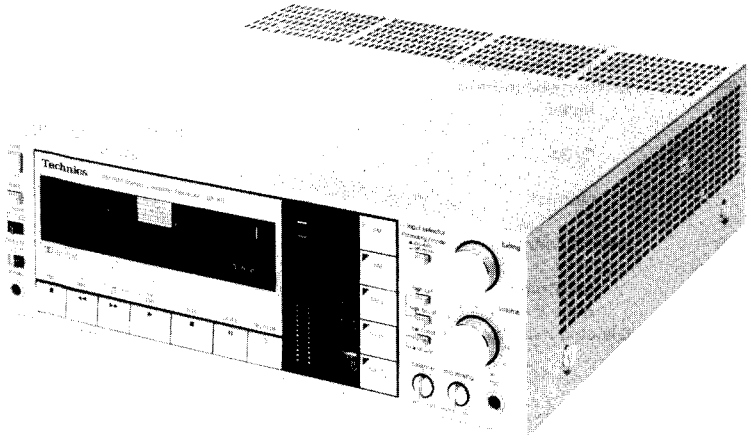
FM/AM Stereo Cassette Receiver

SA-K6

[EGA]

SA-K6(R), (W)

[EGA]



*The colours of this model include silver, red and white.
*The red type model is provided with (R) in the service manual.
*The white type model is provided with (W) in the service manual.

Area

* [EGA] is available in F.R. Germany.

TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 20W (4 Ω)
	2 × 20W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 22W (4 Ω)
	2 × 22W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 24W (4 Ω)
	2 × 22W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,8% (4 Ω)
	0,4% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,8% (4 Ω)
	0,4% (8 Ω)
Nennleistung bei 1 kHz	0,4% (4 Ω)
	0,2% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,2% (8 Ω)
halbe Nennleistung bei 1 kHz	0,1% (8 Ω)
−26 dB Leistung bei 1 kHz	0,2% (4 Ω)
50 mW Leistung bei 1 kHz	0,2% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,8%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,4%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei −3 dB	10 Hz ~ 45 kHz (4 Ω)
Dämpfungsfaktor	15 (4 Ω), 30 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 kΩ
AUX/CD/VIDEO	150 mV/33 kΩ
Micro (MIC)	1,5 mV/10 kΩ
EXT. IN	150 mV/18 kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.)	120 mV
Geräuschabstand	
Nennleistung (4 Ω)	
Phono	70 dB (nach IHF, A: 72 dB 8Ω)
AUX/CD/VIDEO	87 dB (nach IHF, A: 84 dB 8Ω)
Micro (MIC)	70 dB (nach IHF, A: 70 dB 8Ω)
−26 dB Leistung (4 Ω)	
Phono	66 dB
AUX/CD/VIDEO	69 dB
Micro (MIC)	66 dB
50 mW Leistung (4 Ω)	
Phono	65 dB
AUX/CD/VIDEO	68 dB
Micro (MIC)	65 dB
Frequenzgang	
Phono	RIAA-Standardkurve
	±1 dB (30 Hz ~ 15 kHz)
AUX/CD/VIDEO	10 Hz ~ 45 kHz (−3 dB)
Micro (MIC)	20 Hz ~ 15 kHz (−3 dB)
Klangregler	
Tiefenverstärkung (LOW BOOST)	50 Hz, +10 dB
Höhenverstärkung (HIGH BOOST)	20 kHz, +7 dB
Rauschfilter	5 kHz, −6 dB/Okt.
Ausgangsspannung und -impedanz	
Vorverstärker (REC OUT)	150 mV/600 Ω
EXT OUT (EXT. OUT)	150 mV/600 Ω
Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	±3 dB
Übersprechdämpfung (Aux, 1 kHz)	45 dB
Kopfhörerpegel und -impedanz	440 mV/220 Ω
Lautsprecherimpedanz	4 Ω ~ 16 Ω

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ UKW-TUNERTEIL

Wellenbereich	88 ~ 108 MHz
Eingangsempfindlichkeit	1,5 µV (nutzbar nach IHF)
S/R 30 dB	1,3 µV (75 Ω)
S/R 26 dB	1,2 µV (75 Ω)
S/R 20 dB	0,9 µV (75 Ω)
Gesamtklirrfaktor bei 1 kHz	
Mono	0,15%
Stereo	0,3%
Geräuschabstand	
Mono	62 dB (75 dB nach IHF)
Stereo	60 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz +0,5 dB ~ −1,5 dB
Trennschärfe bei Störsender	60 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	40 dB
ZF-Dämpfung bei 98 MHz	85 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
MW-Unterdrückung	50 dB
Übersprechdämpfung	
1 kHz	40 dB
10 kHz	30 dB
Trägerrest	
19 kHz	−65 dB (−70 dB nach IHF)
38 kHz	−67 dB (−72 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,0 µV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	525 ~ 1605 kHz
Eingangsempfindlichkeit (S/R 20 dB)	20 µV, 300 µV/m
Trennschärfe	27 dB
Spiegelfrequenz-Dämpfung bei 1000 kHz	40 dB
ZF-Dämpfung bei 1000 kHz	60 dB

■ TONBANDTEIL

Typ	Stereo-Cassettendeck
Spurlage	4 Spuren/2 Kanäle
Tonkopfbestückung	
Aufnahme/Wiedergabe	Tonkopf aus Hartpermalloy
Löschen	2-Spalt-Löschkopf aus Ferrit
Motoren	elektronisch geregelter Gleichstrommotor
Aufnahmesystem	Wechselstrom-Vormagnetisierung
Vormagnetisierungsfrequenz	85 kHz
Löschsystem	Wechselstrom-Löschung
Bandgeschwindigkeit	4,8 cm/s
Leistungsbandbreite	
Metal	20 Hz~17 kHz
	35 Hz~17 kHz (DIN)
CrO_2	20 Hz~16 kHz
	35 Hz~16 kHz (DIN)
Normal	20 Hz~15 kHz
	35 Hz~15 kHz (DIN)
Fremdspannungsabstand	(Signalpegel = Vollaussteuerung; CrO_2-Band)
mit Dolby	66 dB (über 5 kHz)
ohne Dolby	56 dB
Gleichlaufschwankungen	0,05% (bewertet)
	±0,14% (DIN)
Umspulzeit	ca. 90 Sek. (für Cassette C-60)

■ ALLGEMEINE DATEN

Leistungsaufnahme	205 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 220V
Abmessungen (B×H×T)	315 × 103 × 375 mm
Gewicht	7,1 kg

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■ PROTECTION CIRCUITRY

The protection circuitry may have operated if eigher of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker with an impedance less than the indicated rated impedance of the amplifier are used.

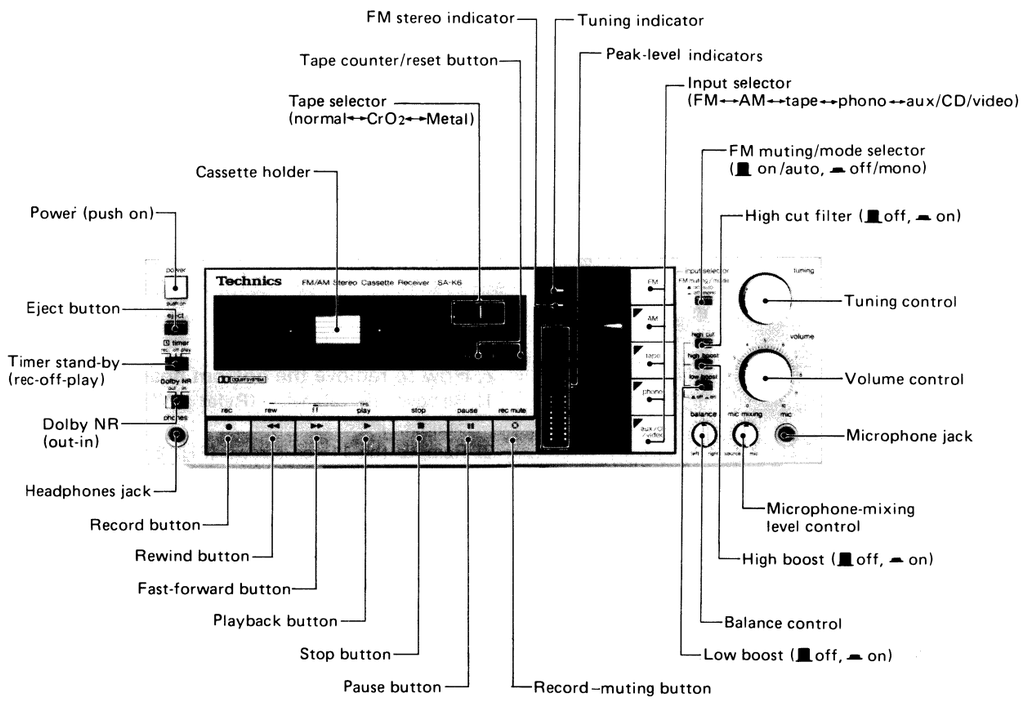
If this occurs, follow the procedure outlined below:

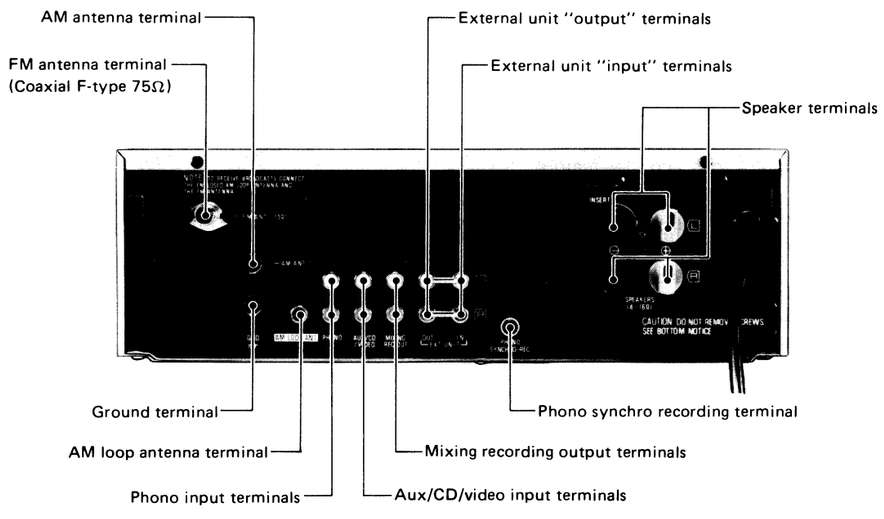
1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again.

Note:

When the protection circuitry functions the unit will not operate unless the power is first turned off and then on again.

■ LOCATION OF CONTROLS





*Phono input capacitance is about 150pF.
*"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.
*Noise reduction system manufactured under license from Dolby Laboratories.

■ MASTER OPERATION OF CASSETTE DECK

1. Auto-repeat playback

1) Depress "play" button. (Indicator "play" lights up, and tape is played.)
2) Depress "play" button again. (Indicator "play" blinks.)

- Auto-repeat playback:
  When the tape comes to its end, it is automatically rewound and played from the beginning. This is repeated until "stop" button is depressed.

2. Automatic selector (TPS : Tape Program Selector)

(With "play" button depressed)

1) Depress "ff" button when selecting the next tune.
   Repeat this operation when selecting a tune, skipping a few tunes.
2) Depress "rew" button when playing the same tune once again.
   Repeat this operation when selecting a tune, skipping a few tunes.

- Automatic selector system (TPS).
  The tape is fast forwarded or rewound to the start point of the desired tune, and is automatically played back.

3. Synchro-recording

Synchro-recording means that the recording automatically begins when the stylus of the turntable is lowered to the disc surface. Then, when the stylus is lifted from the disc surface, a blank recording is made for about 3 seconds, and the unit changes to the recording stand-by mode.
Such synchro-recordings are possible only if a turntable (such as the Technics SL-6) with a synchro-recording terminal is connected to this unit. The Technics SL-6 is an especially excellent choice to use with this unit for synchro-recording, because as many as 10 tunes on the disc can, by "automatic editing," be tape recorded by this unit in any desired order.

1. Press the input selector marked "phono."
2. Press the record button (recording stand-by mode).
3. Prepare the turntable for disc play.
4. Press the start button of the turntable. (The recording will begin automatically.)

During disc play (while the stylus is on the disc surface):

- The record-mute button and pause button have no effect.
- To stop during a recording, press the stop button.
- To start recording once again, press the record button. (The recording starts immediately, without going to the recording stand-by mode.)

Note:

*When synchro-recording, make sure that the ground terminal of the turntable is connected to that of this unit with ground wire (attached to the turntable).
If the wire connection is not perfect, synchro-recording is not possible.
*When clearing the synchro-recording mode to start normal recording, be sure to disconnect the synchro-recording cord on this unit side.
Disconnecting the cord on the turntable side will not cancel the synchro-recording system.

4. Re-recording

"Re-recording" as used here means to find the beginning a tune to be re-recorded, to make a blank recording (about 3 seconds) before the recording, and then to make the new recording itself.

1. While pressing the record button during the recording stand-by mode or during a reocrding, rewind the tape by pressing the rewind button.
2. After the tape is rewound, make a blank recording (about 3 seconds). The unit will then be in the recording stand-by mode.
3. Press the playback button; the recording will begin.

- Note that the above steps from re-recording should be followed only after the original recording has been in progress for at least 10 seconds or more (in order to aussure precise return to the beginning of the tune).

5. Microphone mix-recording

Another tape deck is necessary when making a mix recording if one of the sound sources is a recorded tape.

1. Proceed with the microphone mixing.
2. Record by following the procedure described on the page at the left.

- Distribution of sound during recording.
  Sound is recorded as adjusted by the microphone-mixing level control (as heard from the speakers).

6. Tape-to-tape recording (tape dubbing)

If another tape deck is connected to the "MIXING REC OUT" and "AUX/CD/VIEO" terminals on the back of this unit, dubbing (tape-to-tape recording) between the cassette deck of this unit and the other tape deck is possible.

1. Dubbing from this unit to another tape deck.
   SA-K6 operation:
   1) Press the input selector marked "tape".
   2) Follow the procedure for tape playback operation.
   Other tape deck operation:
   3) Follow the procedure for recording.

- Note that an abnormal sound will be emitted if the input selector marked "aux/CD/video" is pressed.

2. Dubbing from another tape deck to this unit.
   Other tape deck operation:
   1) Follow the procedure for tape playback.
   SA-K6 operation:
   2) Press the input selectors to the "aux/CD/video" position.
   3) Follow the procedure for recording.

7. A blank recording

A blank recording can be made if the record-mute button is pressed while a recording is in progress or while the unit is in the recording stand-by mode. This can be conveniently used, for example, to avoid recording commercials or disc-jockey chatter while recording a radio broadcast or to make a blank-recorded space of any desired length (in order to make the TPS features function smoothly).

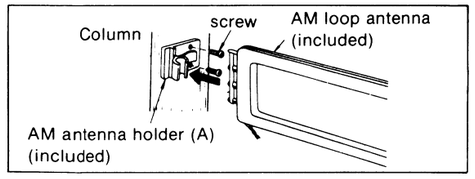
1. After the recording is finished, press the record-mute button:
   a) Press it once momentarily.
      The record indication lamp will flash, and a blank recording of about 3 seconds will be made (automatic record muting).
   b) Press the button slightly longer.
      The record indication lamp will flash, and the blank recording will be made as long as the button is pressed.
2. The unit will then be in the recording stand-by mode.
3. Press the playback button and start the recording.

■ INSTALLATION OF THE AM LOOP ANTENNA

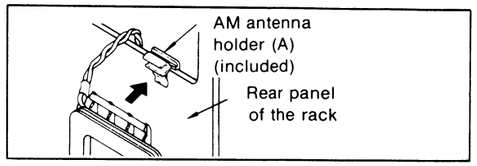
This unit includes a highly sensitive loop antenna for AM broadcast reception. No outdoor antenna is necessary unless this unit is used in an area where signals are especially weak. (Connect the AM loop antenna even when an outdoor antenna is used.)

Pay attention to the following points when attaching the antenna.
1) Find the height and direction of the antenna where reception is best and then fix it vertically to the wall, rack, etc.
2) Do not attach it horizontally (to do so would impair reception).
3) Do not attach it close to metal surfaces, power cords, or speaker wires (to do so would result in noise).
4) Do not attach it close to a tape deck (when the tape deck is being used, chirping or beeping sounds may be received).

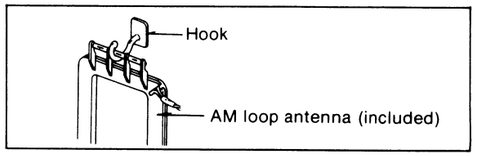
1) When attaching the antenna to a wall, column.



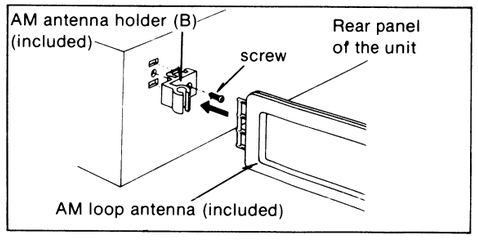
2) When attaching the antenna to the rack.



3) If a hook is used (if the holder can't be attached by screws)



4) When attaching the antenna to the unit.



* Holder (A) . . . . . Part No. SMA233–1
* Holder (B) . . . . . Part No. SMA231

■ BEFORE REPAIR AND ADJUSTMENT

1. Turn off the power supply and short-circuit of power supply capacitors (C701, C702, 6800μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Do not short between C701/702 by screwdriver. It may damage the component.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current is free of abnormality. The consumed current at 60Hz/50Hz in no signal mode is shown below with respect to supply voltage 220V.

Power supply voltage		AC220V
Consumed current	50 Hz	75 ~ 155mA
	60 Hz	75 ~ 155mA

■ DISASSEMBLY INSTRUCTIONS

1. How to remove the cabinet

1) Remove the screws **(Fig. 1 : ❶ ~ ❻)** of the cabinet.
2) Hold the cabinet on the right and left sides, then lift it up from the chassis.

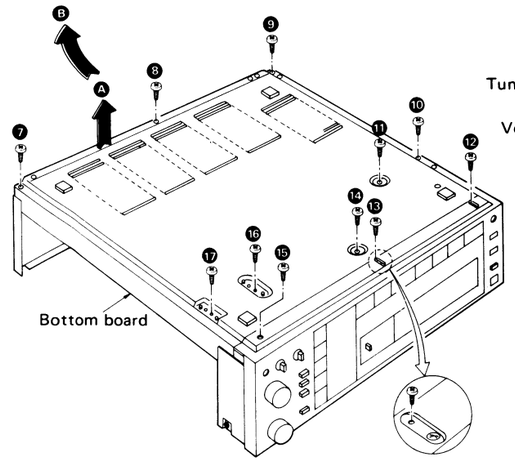


Fig. 2

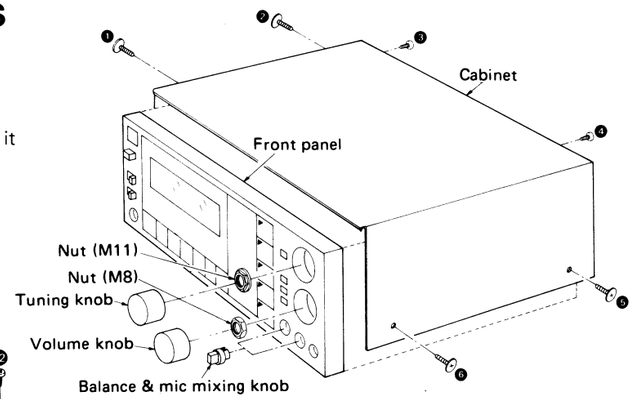


Fig. 1

2. How to remove the bottom board

1) Remove the cabinet. **(Refer to "How to remove the cabinet.")**
2) Remove the 11 red screws **(Fig. 2 : ❼ ~ ⓱)** of the bottom board.
3) Lift up the rear of bottom board in the direction of arrow Ⓐ **(Fig. 2).**
4) Next, pull it in the direction of arrow Ⓑ and remove the bottom board sandwiched between front panel and chassis.

3. How to remove the front panel (With cassette deck mechanism)

1) Remove the cabinet. **(Refer to "How to remove the cabinet.")**
2) Remove the 6 red screws **(Fig. 3** and **4 : ⓬ ~ ⓯ , ⓲** and **⓳)** of the front panel and bottom board.

Note: * Loosen the screw ⓴ of **Fig. 3** which is used to secure the cassette.
* Screw ⓳ also fastens the ground lug terminal. Remember to tighten the screw when installing the front panel.

3) Remove the tuning and volume knobs, and then remove the nuts. **(Refer to Fig. 1)**
4) Remove the balance and mic mixing knobs.

Note: * Remove the balance and mic mixing knobs as shown in **Fig. 5**.

5) Pull out the lead wire connectors mentioned in.Table 1, and remove the front panel from the chassis.

Note: * When fitting the lead wire connectors, refer to the "printed circuit board wiring connection diagram" on page 17 .

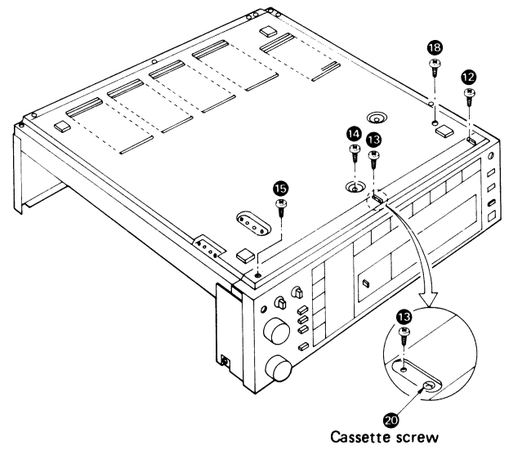


Fig. 3

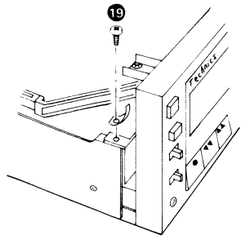
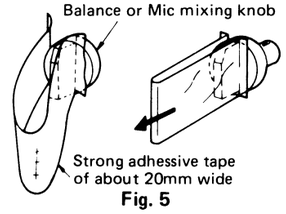


Fig. 4



① Stick the adhesive tape to the knob.
② Pull the tape to remove the knob from the chassis.

Fig. 5

	Lead wire connectors to be pulled out when removing front panel		
Main circuit side	J104 : 6 pin connector J110 : 3 pin connector J114 : 4 pin connector	J107 : 6 pin connector J111 : 3 pin connector J115 : 8 pin connector	J108 : 3 pin connector J113 : 5 pin connector J702 : 2 pin connector
Front panel side	J105 : 3 pin connector J117 : 4 pin connector	C–A (Cassette motor) : 9 pin connector	

Table 1

4. How to remove cassette deck mechanism

1. Remove the front panel. **(Refer to "How to remove the front panel.")**
2. Remove the 4 eed screws **(Fig. 3** and **6 : ⑳ ~ ㉓)** of the front panel.
3. Remove the screw **(Fig. 6 : ㉔)** of the front panel.
4. Depress "Eject" button to keep the cassette holder open.
5. Remove the cassette mechanism from the front panel.

Note: *When installing the cassette deck mechanism on the front panel, set the cassette holder open/close spring to the bracket on the left side of cassette deck mechanism as in **Fig. 7**.

*Screw ㉓ is used to fit the ground lug terminal. When installing the cassette deck mechanism on the front panel, remember to fit the ground lug terminal.

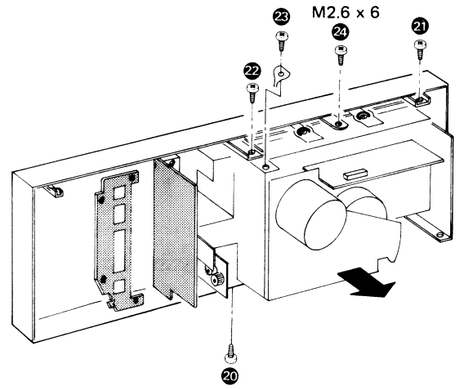


Fig. 6

5. How to remove the cassette holder panel

1. Depress "Eject" button to open the cassette holder.
2. Insert a small blade screwdriver between cassette holder and cassette holder panel, then remove the panel by force. **(See Fig. 8** and **9)**

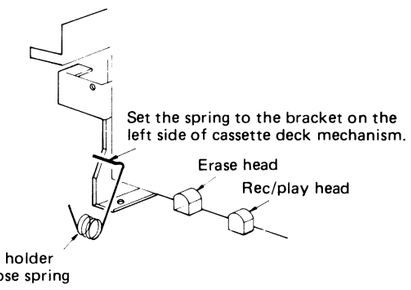

Set the spring to the bracket on the left side of cassette deck mechanism.
Erase head
Rec/play head
Cassette holder open/close spring

Fig. 7

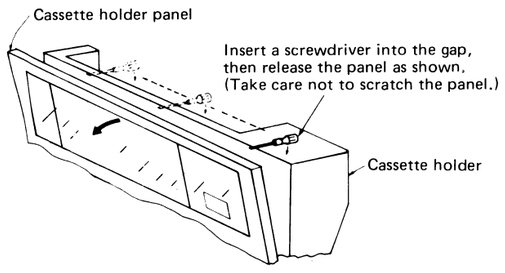

Cassette holder panel
Insert a screwdriver into the gap, then release the panel as shown. (Take care not to scratch the panel.)
Cassette holder

Fig. 8

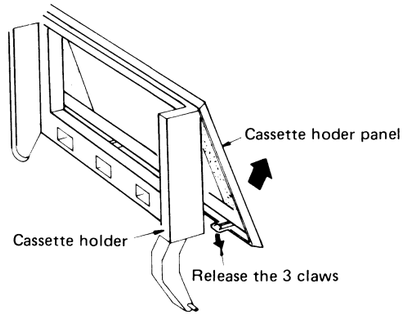


Fig. 9

6. How to remove the cassette holder

1. Remove the front panel. **(Refer to "How remove the front panel.")**
2. Remove the cassette deck mechanism. **(Refer to "How to remove the cassette deck mechanism.")**
3. Insert a small blade screwdriver between cassette holder and bracket, then remove the holder from the bracket. **(See Fig. 10)**.
4. Slightly shift the cassette holder to the left and open the holder sufficiently, then remove it toward the front of front chassis. **(See Fig. 11)**

Note: When fitting cassette holder to front panel, set the cassette holder open/close spring to the bracket on the left side of cassette deck mechanism as in **Fig. 7**.

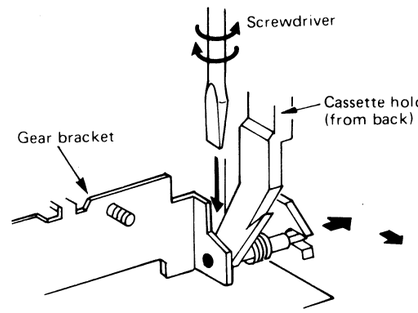


Fig. 10

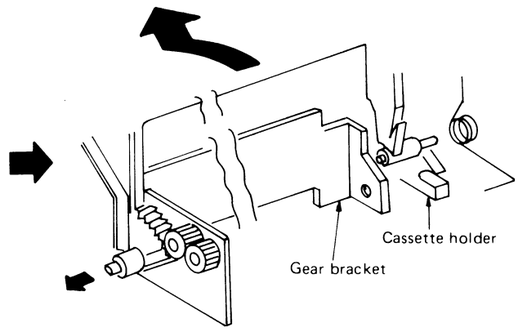


Fig. 11

7. How to remove the cassette buttons

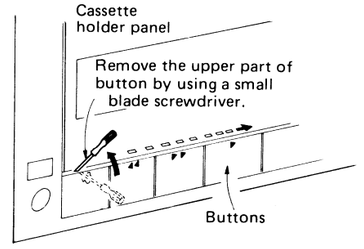


Fig. 12

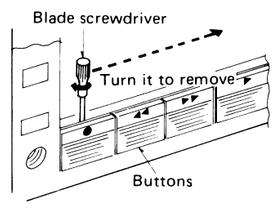


Fig. 13

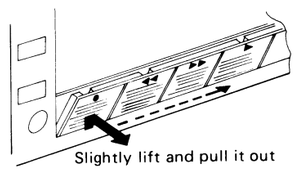


Fig. 14

1. Remove the cassette holder panel. **(Refer to "How to remove the cassette holder panel.")**
2. Insert a small blade screwdriver into the gap at the button, then release the upper parts of buttons from "rec" to "rec mute" in order as in **Fig. 12** or **13**.
3. Slightly lift the button section and remove it from the front panel. **(See Fig. 14, 15)**

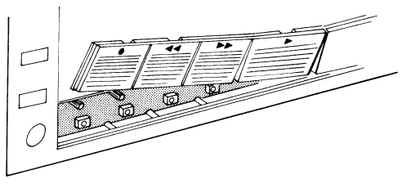


Fig. 15

8. How to replace the head

1. Remove the front panel and cassett deck mechanism. **(Refer to "How to remove the front panel" and "How to remove cassette deck mechanism.")**
2. Remove the head screw and replace the head. **(See Fig. 16)**

Note: *After replacing the head, adjust the cassette deck according to "Measurement and adjustment" on page 14.

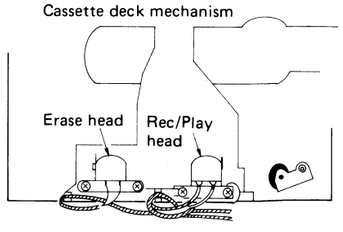


Fig. 16

9. How to remove the tuner circuit Ass'y.

1) Remove the cabinet and front panel. **(Refer to "How to remove the cabinet" and "How to remove the front panel.")**
2) Remove the screw ㉕ which secures the tuner circuit Ass'y on the rear panel. **(Fig. 18-1)**
3) Remove the screw ㉛ of the shield cover. **(Fig. 17)**
4) Remove the FM antenna pin on the rear panel. **(Fig. 17)**
5) Remove the tuner circuit Ass'y from main P.C.B.

Note: When removing P.C.B. from tuner circuit Ass'y fasten the dial drum to the chassis bracket as follows:

(1) Remove the shield cover. **(Fig. 18-1)**
(2) Turn the tuning drum clockwise (Frequency is maximum.)
(3) Remove the 2 lock pins from the rear of the bracket. **(Fig. 18-1)**
(4) Insert the lock pins into the 2 holes of tuning drum to secure the drum. **(Fig. 18-2)**
(5) Remove the tuning drum screw ㉖. **(Fig. 18-1)**

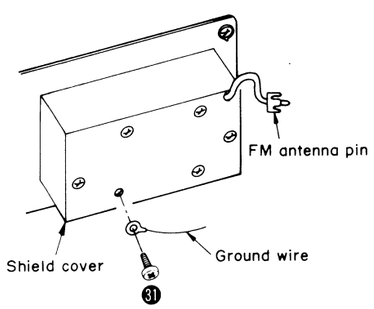


Fig. 17

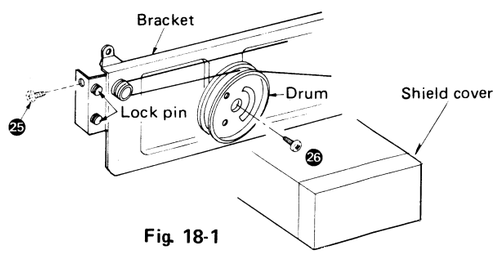


Fig. 18-1

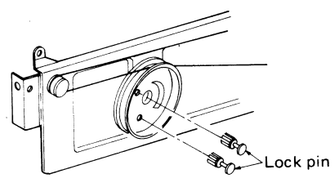


Fig. 18-2

10. Gear grease of cassette holder

After replacing the cassette holder gear or if the cassette holder opens too fast, apply grease (part No. GP501MR) to the two grooves of gear shaft. **(See Fig. 19)**

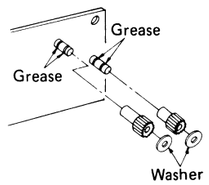


Fig. 19

11. How to remove the power amplifier IC

1) Remove the cabinet. **(Refer to "How to remove the cabinet".)**
2) Remove the bottom board. **(Refer to "How to remove the bottom board.)**
3) Remove the 2 screws **(Fig. 20 : ㉗, ㉘)** of heat-sink A.
4) Remove the heat-sink A from the heat-sink B.
5) Remove the 2 screws **(Fig. 21 : ㉙, ㉚)** of power amplifier IC.
6) Unsolder the IC.
7) When fitting the IC (and heat-sink A), apply a heat diffusing agent to the back of IC (and heat-sink A).

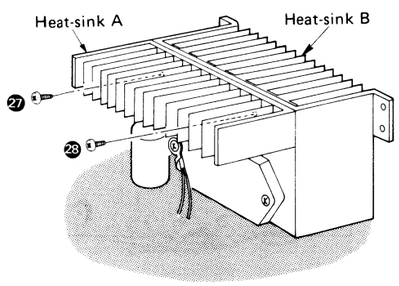


Fig. 20

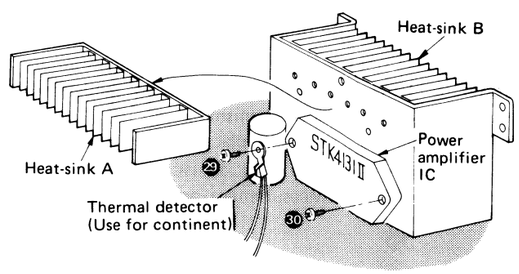


Fig. 21

• How to replace chips (resistor and jumper)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in **Fig. 22**.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in **Fig. 23**.

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

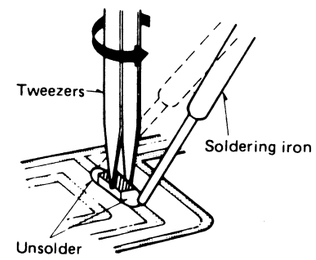


Fig. 22

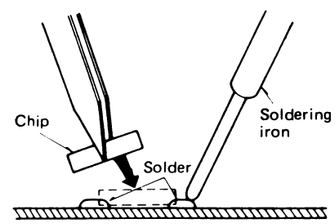


Fig. 23

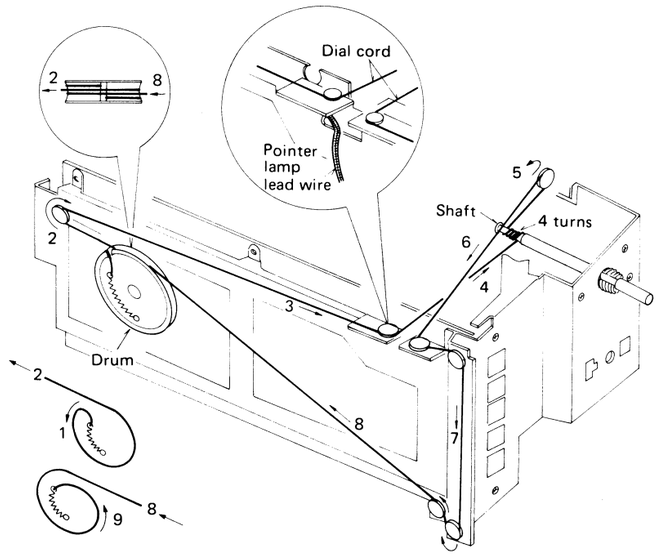
• Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

■ DIAL CORD INSTALLATION GUIDE

For threading a fresh cord, proceed as follows.

1. Prepare a fresh cord more than 130cm (51-2/3") in length.
2. Bring the variable capacitor into a state where the drum is completely turned to the left (maximum capacity and lowest frequency for the variable capacitor).
3. Direct the cord in the order from 1 to 9.
4. Stretch the cord in such a tension as the spring length is elongated by 1.5 times that of the original state.
5. Fix the knot of the cord with the adhesive.



■ MESSUNGEN UND JUSTIERUNGEN

VERSTÄRKERTEIL

Es müssen keine Teile justiert werden.

UKW/MW-TUNER

(Anmerkung)

- Für die Demontage und Montage des Tuner-Blocks, siehe "Entfernen des Tuner-Schaltungsbauteils" auf Seite 9. Die demontierte Schaltungsplatte sorgfältig reparieren und darauf achten, daß kein Kurzschluß verursacht wird.
- Die Frequenz- und Anzeigeskala kann mit L204 (UKW) und L206 (MW) justiert werden. Wenn es nötig ist, die Position des Drehkondensators zu kennen, ohne dazu die Schaltungsplatte zu montieren, kann der Drehkondensator provisorisch auf der Trommel befestigt, die Frequenz mit dem Zeiger justiert und anschließend der Drehkondensator wieder entfernt werden.
- Beim Abgleichen der HF ist zuerst die Spule abzugleichen (Abgleich der niedrigen Frequenz), und dann allmählich der lose Trimmer anzuziehen, um den Abgleich der HF vorzunehmen. Für den Abgleich der Oszillationsspule und des ZFT ist ein nichtmetallischer Schraubenzieher zu verwenden.

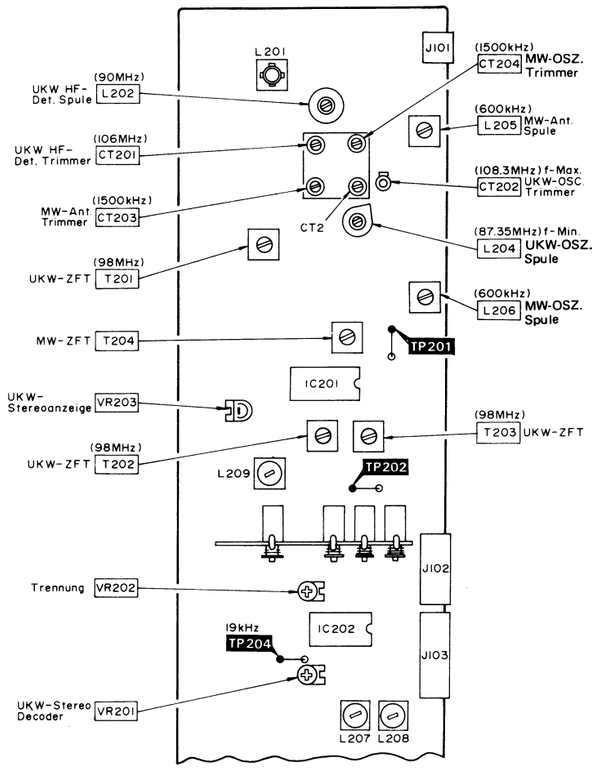
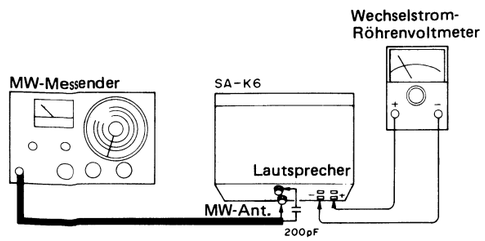


Abb. 24



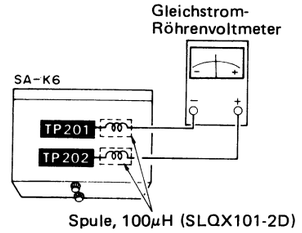


Abb. 25

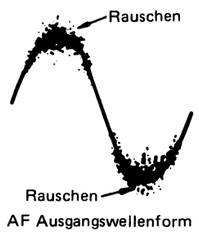


Abb. 26

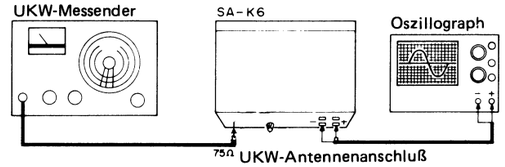


Abb. 27

AM (MW)-EINSTELLUNG

*** Stellungen und zu benutzende Geräte**

1. Elektronisches Voltmeter für Wechselstrom (VTVM).
2. AM (MW)-Meßsender (AM-MO).
3. Bereichsschalter . . . . . AM
4. Netzspannung auf ihrem Sollwert halten.
5. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
6. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.

Nr.	AM (MW)-MESSENDER ANSCHLUSS	AM (MW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	AM (MW)-ZF-ABGLEICH					
1	MW-MO über 200 pF-Kondensator an den AM-Antennenanschluß anschließen, wie in Abb. 24 gezeigt. (Starker Eingang)	450 kHz (400 Hz Modulat., 30%)	Kein Empfang	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "Speaker" anschließen.	T204 (1. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so justieren, daß der Ausgang den maximalen Wert erreicht.
	AM (MW)-HF-ABGLEICH					
2	MW-MO über 200 pF-Kondensator an den AM-Antennenanschluß anschließen, wie in Abb. 24 gezeigt. (Schwacher Eingang)	600 kHz (400 Hz Modulat., 30%)	600 kHz	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "Speaker" anschließen.	L206 (Osc. Spule) L205 (Ant. Spule)	1. Auf max. Ausgang abgleichen.
3		1500 kHz (400 Hz Modulat., 30%)	1500 kHz		CT204 (Osc. Trimmer) CT203 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Schritt (2) und (3) sind zu wiederholen.

FM (UKW)-EINSTELLUNG

*** Stellungen und zu benutzende Geräte**

1. UKW-Meßsender (FM-MO)
2. Klirrfaktor-Meßbrücke.
3. Oszillograph.
4. Elektronische Voltmeter für Wechsel-und Gleichstrom (VTVM).
5. Signalfrequenzmesser (geeignet für 19 kHz und 108 MHz)
6. Stereo-Modulator (oder Trennmesser)
7. Bereichsschalter . . . . . FM
8. Den UKW-Betriebsartenschalter in die "mono"-Position stellen.
9. Die anderen Einstellungen sind gleich wie bei der MW-Justierung.

*** Vorbereitung des UKW-Meßoszillators (UKW-MO)**

Die Normal-Eingangsleistung dieses Gerätes beträgt 60 dB (1 mV), 400 Hz, 100% Modulation. (Wegen der Dämpfung bei Verwendung von Koaxialkabeln, muß die MO-Ausgangsleistung 6 dB oder mehr betragen: d.h. wenn die Eingangsleistung 60 dB beträgt, muß der MO-Ausgang 66 dB betragen.

Nr.	FM (UKW)-MESSENDER ANSCHLUSS	FM (UKW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	UKW-ZF-ABGLEICH					
4	———	Kein Signal	Kein Empfang	Ein Gleichstromröhren-Voltmeter zwischen **TP201** und **TP202** über eine Drosselspule verbinden (siehe Abb. 25)	T202 (Diskriminator FT)	• FM muting/FM mode-Schalter, auf "off/mono" stellen. • Den Kern von T202 so justieren, daß die gemessene Spannung im signallosen Zustand 0mV im 300mV Bereich beträgt.
	UKW-HF-ABGLEICH					
5	UKW-MO an UKW-Antennen, anschließen. (Schwacher Eingang) (Abb. 27)	87,35 MHz (400 Hz Modulat., 100%)	87,35 MHz (Frequenz min.)	Oszillograph über den Ausgang "Speaker" anschließen.	L204 (Osc. Spule)	1. Einen schwachen Eingang anlegen, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 26) 3. Die Einstellung von (5), (6), (7) und (8) wiederholen, bis die Frequenz mit der Skala übereinstimmt.
6		108,3 MHz (")	108,3 MHz (Frequenz max.)		CT202 (Osc. Trimmer) L202 (Det. Spule)	
7		90 MHz (")	90 MHz			
8		106 MHz (")	106 MHz		CT201 (Det. Trimmer)	

Nr.	UKW MESSENDER ANSCHLUSS	UKW MESSENDER FREQUENZ	SKALENZEIGEREINSTELLUNG DES TUNERS	ANZEIGEGERÄT (Röhrenvoltmeter order Oszillograph)	ABGLEICH PUNKTE	BEMERKUNGEN
	ABGLEICH AUF MIN. VERZERRUNG INSTELLUNG UKW-MONO					
9	UKW-MO an UKW-Antennen anschließen, wie in Abb. 27 gezeigt. (60 dB in den Antenneneingang anlegen.)	98 MHz (400 Hz Modulat. 100%	98 MHz	Ein Gleichstrom-Voltmeter zwishen **TP201** und **TP202** über eine Drosseispule anschließen.	T202 (Diskriminator FT)	Den Kern von T202 so justieren, daß die gemessene Spannung im signallosen Zustand 0 mV im 300 mV Bereich beträgt.
10				Klirrfaktor-Meßbrücke an Ausgang "Speaker" anschließen.	T203 (Diskriminator FT)	Kern von T203 für minimale Verzerrung der rechten und linken Kanäle justieren.
	UKW-STEREO-DEKODER-ABGLEICH					
	UNTER VERWENDUNG EINES ZÄHLERS			ALTERNATIV-MESSMETHODE		
	1. Unmoduliertes Mono-Signal von 98 MHz in das Gerät sen. speisen. (Vgl. Abb. 28) 2. FM Mode-Schalter auf "FM auto" stellen. 3. Zähler über einen Widerstand von 100k Ohm an **TP204** anschließen. 4. **VR201** auf 19 kHz±30 Hz einstellen.			1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. **VR201** so einstellen, bis die Stereolampe aufleuchtet. Schleifer von **V201** sichern, wie in Abb. 29 gezeigt.		
	STEREOVERZERRUNGS-ABGLEICH					
11	UKW-MO an den UKW-Antennenanschluß anschließen. (60 dB an den Antennenanschluß anlegen.) (Pilot 10% Mod. Stereo-Signal)	98 MHz (100% Mod. mit 400 Hz) (L-oder R-Betrieb)	98 MHz	Verzerrungs-Analysator durch Tiefpassfilter an "Speaker"-Anschlüsse des Gerätes anschließen. (fc = 15kHz~19kHz)	T201 (ZFT)	Den Kern von T201 so abgleichen, daß die Verzerrung des rechten Kanals minimal ist.
	TRENNUNGS-ABGLEICH					
12	UKW-MO an den UKW-Antennenanschluß anschließen. (60 dB an den Antennenanschluß anlegen.) (Pilot 10% Mod. Stereo-Signal)	98 MHz (1 kHz Modulat., 100%) (L-oder R-Betrieb)	98 MHz	Wechselstrom-Röhrenvoltmeter durch Tiefpassfilter an die "Speaker"-Anschlüsse des Gerätes anschließen. (fc = 15kHz~19kHz)	VR202	1. VR202 so justieren daß der R-Ausgang minimal wird, wenn der Stereo-Modulator im L-Zustand (L-Kanal-Modulation) ist. 2. VR202 so justieren, daß der L-Ausgang minimal wird, wenn der Stereo-Modulator im R-Zustand (R-Kanal-Modulation) ist.
	JUSTIERUNG DES UKW-STEREOANZEIGE-EIN-SIGNALEINGANGSPEGELS					
13	UKW-MO an den UKW-Antennenanschluß anschließen. (60 dB an den Antennenanschluß anlegen.) (Pilot 10% Mod. Stereo-Signal)	98 MHz (1 kHz Modulat., 100%) (L-oder R-Betrieb)	98 MHz	UKW-Stereoanzeige	VR203	Ein 12 dB-Signal an den UKW-Antennenanschluß anlegen und VR203 so justieren, daß die Anzeige aufleuchtet.

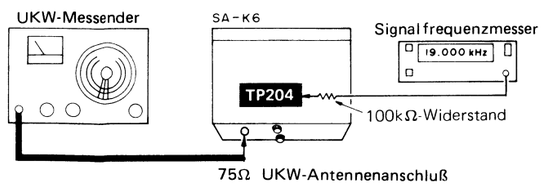
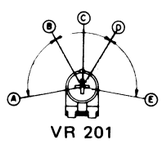


Abb. 28



Ⓐ–Ⓑ, Ⓓ–Ⓔ : Stereo AUS Position
Ⓑ–Ⓓ : Stereo EIN Position (Anzeige leuchtet)
Ⓒ : Punkt der Pilot-Schaltung justieren

Abb. 29

JUSTIERUNG DES CASSETTENDECKS

Anmerkung:

1. Falls der Kopf einem Leitungstest mit einem Prüfgerät unterzogen wird, so wird er dadurch magnetisch aufgeladen. Es ist daher nötig, den Kopf nach dem Leitungstest zu entmagnetisieren.
2. Nach dem Ersetzen des Aufnahme/Wiedergabe-Kopfes müssen die folgenden Justierungen durchgeführt werden.
3. Beim Justieren des Kopfazimuts sind die Cassettenknöpfe (siehe "Entfernen der Cassettenknöpfe" auf Seite 8) zu entfernen, und dann ist ein Schraubenzieher in die Vertiefungen der Schalter-Schaltungsplatte zu stecken, um die Schraube zu entfernen.
4. Um den Aufnahmezustand zu wählen ist die Auswurftaste zu drücken, um die Cassettenhalterung zu öffnen, und während der Aufnahmeverhinderungs-Schalter (S412) gedrückt gehalten wird, ist die Aufnahmetaste und anschließend die Wiedergabetaste zu drücken. (Oder es ist eine vollkommen neue Cassette zu benutzen.)

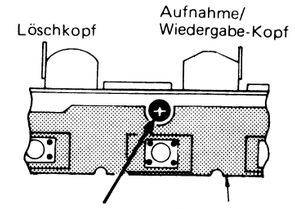


Abb. 30

*** Zu verwendende Instrumente**

1. Elektronisches Wechselstrom-Voltmeter (Röhrenvoltmeter)
2. Frequenzzähler
3. AF-Oszillator

*** Testband**

QZZCFM (Abb. 31)
QZZCWAT (Abb. 32)

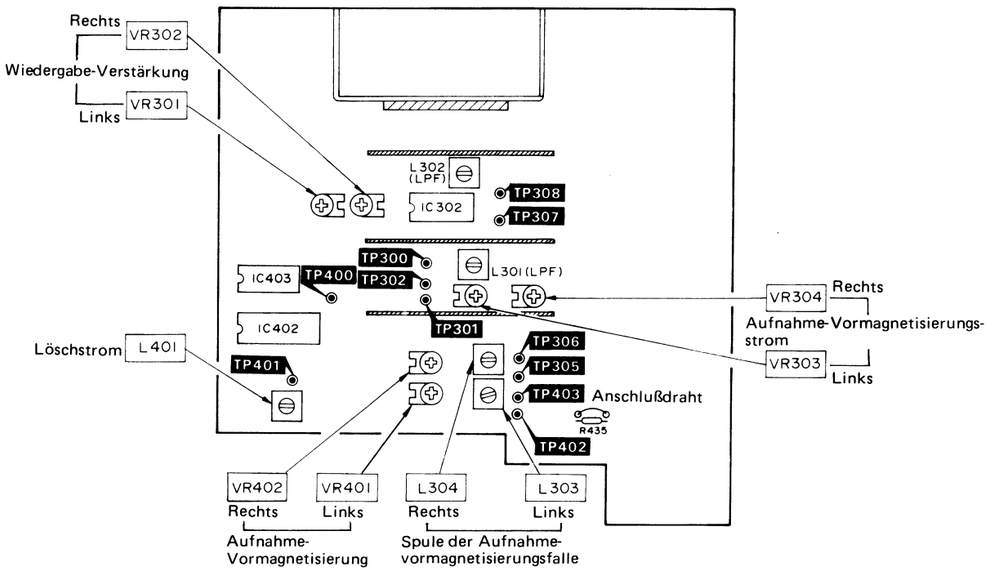
*** Einstellungen**

1. Lautstärkeregler . . . . . 0 (Minimum)
2. Balanceregler . . . . . Mitte
3. Baßverstärkungstaste . . . . . off
4. Rauschfiltertaste und Höhenverstärkungstaste . . off
5. Mikrofon-Mischregler . . . . . Mitte
6. Eingangswahlschalter . . . . . "tape"
7. Timerschalter . . . . . off
8. Dolby-Rauschunterdrückungs-Schalter . . . . . out

Nr.	JUSTIERUNGEN	RÖHRENVOLTMETER-ANSCHLUSS	ZU JUSTIERENDE TEILE	JUSTIERMETHODE
1	Kopfazimut	(Linker Kanal) • Die Positive Seite an **TP307** und die negative Seite an **TP300** (Masse) anschließen. (Rechter Kanel) • Die positive Seite an **TP308** und die negative Seite an **TP300** (Masse) anschließen.	Aufnahme/ Wiedergabekopfwinkel-Justierschraube (Siehe Abb. 30)	1. Die Azimut-Cassette (QZZCFM 8kHz) wiedergeben. 2. Die Justierschraube für den Aufnahme-/ Wiedergabe-Kopfwinkel justieren. 3. Beide Kanäle messen und die Pegel auf gleichen Ausgang abgleichen. 4. Nach der Justierung die Kopfjustierschraube mit Lack sichern.
2	Löschstrom	• Die positive Seite an **TP401** und die negative Seite an **TP400** (Masse) anschließen.	Anschlußdraht (J11) L401 (*1)	1. Den Bandsorten-Wahlschalter in die "metal"-Position stellen. 2. Das Gerät in den Aufnahmezustand versetzen. 3. Falls die Anzeige des Voltmeters 363mV übersteigt, den Anschlußdraht, der parallel zu R435 der Bandwahlschaltung ist, abtrennen. **Standardwert** Bandwahlschalter-Position: Spannung Metal: 300 – 400 mV CrO_2: 210 – 290 mV Normal: 160 – 220 mV
3	Aufnahme-Vormagnetisierung	• Die positive Seite an **TP301** und die negative Seite an **TP300** (Masse) anschließen.	VR401 (linker Kanal)	1. Den Bandsorten-Wahlschalter in die "normal"-Position stellen. 2. Das Gerät in den Aufnahmezustand versetzen. 3. VR401 und VR402 auf eine Anzeige von 5,7mV auf dem Röhrenvoltmeter abgleichen. **Standardwert** Bandwahlschalter-Position: Spannung Metal: 7,7 – 12,9 mV CrO_2: 5,2 – 8,7 mV Normal: 3,9 – 6,6 mV
		• Die positive Seite an **TP302** und die negative Seite an **TP300** (Masse) anschließen.	VR402 (rechter Kanal)	

(*1) L401 sollte nur dann justiert werden, wenn der Löschstrom nicht auf den Standardwert justiert werden kann, nachdem L401 ersetzt worden ist.

Nr.	JUSTIERUNGEN	RÖHRENVOLTMETER-ANSCHLUSS	ZU JUSTIERENDE TEILE	JUSTIERMETHODE
4	Aufnahme-Vormagnetisierungs-strom (linker Kanal)	• Das Wechselstrom-Röhrenvoltmeter der positiven Seite an TP307 und die negative Seite an TP300 (Masse) anschließen. • Den Oszillator an den "Aux" Eingangsanschluß des Gerätes anschließen. • Ein 400Hz-Signal anlegen und den Ausgang des AF-Oszillators so abgleichen, daß das Wechselstrom-Röhrenvoltmeter 410mV anzeigt. • Anschließend das Wechselstrom-Röhrenvoltmeter zwischen TP301 und TP300 anschließen	VR303 (linker Kanal)	1. Den Bandsorten-Wahlschalter in die "normal"-Position stellen. 2. Den Eingangswahlschalter in die "aux"-Position stellen. 3. Das Gerät in den Aufnahmezustand versetzen. 4. VR303 so abgleichen, daß das zwischen TP301 und TP300 angeschlossene Wechselstrom-Röhrenvoltmeter 460μV anzeigt. (Vor der Justierung ist die Oszillation durch Kurzschließen zwischen TP402 und TP403 zu unterbrechen.) **Standardwert** Bandwahlschalter-Position: Spannung Metal: 523 – 797 μV CrO_2: 436 – 659 μV Normal: 368 – 557 μV
5	Aufnahme-Vormagnetisierungs-strom (rechter Kanal)	• Das Wechselstrom-Röhrenvoltmeter mit der positiven Seite an TP308 und mit der negativen Seite an TP300 (Masse) anschließen. • Den Oszillator an den "Aux"-Eingangsanschluß des Gerätes anschließen. • Ein 400Hz-Signal anlegen und den Ausgang des AF-Oszillators so abgleichen, daß das Wechselstrom-Röhrenvoltmeter 410mV anzeigt. • Anschließend das Wechselstrom-Röhrenvoltmeter zwischen TP302 und TP300 anschließen	VR304 (rechter Kanal)	1. Den Bandsorten-Wahlschalter in die "normal"-Position stellen. 2. Den Eingangswahlschalter in die "aux"-Position stellen. 3. Das Gerät in den Aufnahmezustand versetzen. 4. VR304 so abgleichen, daß das zwischen TP302 und TP300 angeschlossene Wechstrom-Röhrenvoltmeter 460μV anzeigt. (Vor der Justierung ist die Oszillation durch Kurzschließen zwischen TP402 und TP403 zu unterbrechen.) **Standardwert** Bandwahlschalter-Position: Spannung Metal: 523 – 791 μV CrO_2: 436 – 659 μV Normal: 368 – 557 μV
6	Spule der Aufnahmevor-magnetisierungs-falle	• Die positive Seite an TP305 und die negative Seite an TP300 (Masse) anschließen.	L303 (linker Kanal)	1. Den Bandsorten-Wahlschalter in die "normal"-Position stellen. 2. Das Gerät in den Aufnahmezustand versetzen. 3. Auf minimale Spannungsanzeige des Wechselstrom-Röhrenvoltmeters abgleichen. **Standardwert** Weniger als 50mV.
		• Die positive Seite an TP306 und die negative Seite an TP300 (Masse) anschließen.	L304 (rechter Kanal)	
7	Wiedergabe-Verstärkung	• Die positive Seite an TP307 und die negative Seite an TP300 (Masse) anschließen.	VR301 (linker Kanal)	1. Den Bandsorten-Wahlschalter in die "normal"-Position stellen. 2. Die Testcassette für den 315Hz (0dB)-Frequenzgang wiedergeben. Anschließend VR301 und VR302 so abgleichen, daß die Ausgangsleistung 410mV beträgt. **Standardwert** 387 ~435 mV.
		• Die positive Seite an TP308 und die negative Seite an TP300 (Masse) anschließen.	VR302 (rechter Kanal)	



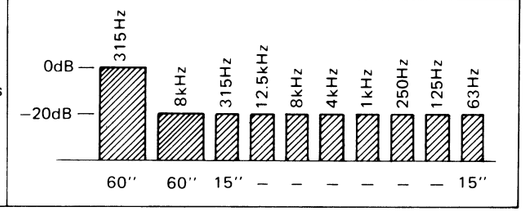
Referenz	Bedienelemente der Aufnahme (QZZCFM)
Aufnahmepegel: –20dB & 0dB, 160nWb/m Entzerrer: 3180μs, 120μs Bandgeschwindigkeit: 4,75 cm/s Aufnahmezeit: 4 min. Inhalt: Nur für einen Durchgang, wie in der Darstellung gezeigt.	

Abb. 31

(QZZCWAT)

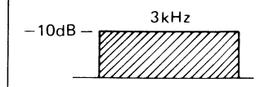


Abb. 32

• Die Motorgeschwindigkeit ist zu justieren, falls der Motor des Cassettendecks ausgewechselt worden ist.

1. Für die Gleichlaufschwankungs-Justierung ist die Testcassette abzuspielen. (Abb. 32)
2. Den Frequenzzähler an den Lautsprecheranschluß des Gerätes anschließen.
3. Die Justierschraube hinten am Motor so justieren, daß die Ausgangsfrequenz des Lautsprecheranschlußes 3 kHz beträgt. (Abb. 33)

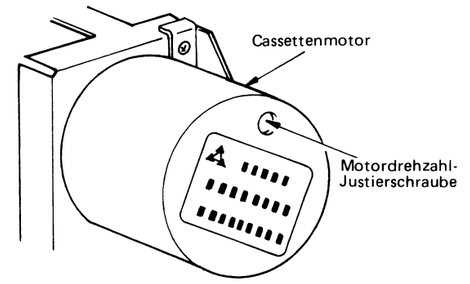
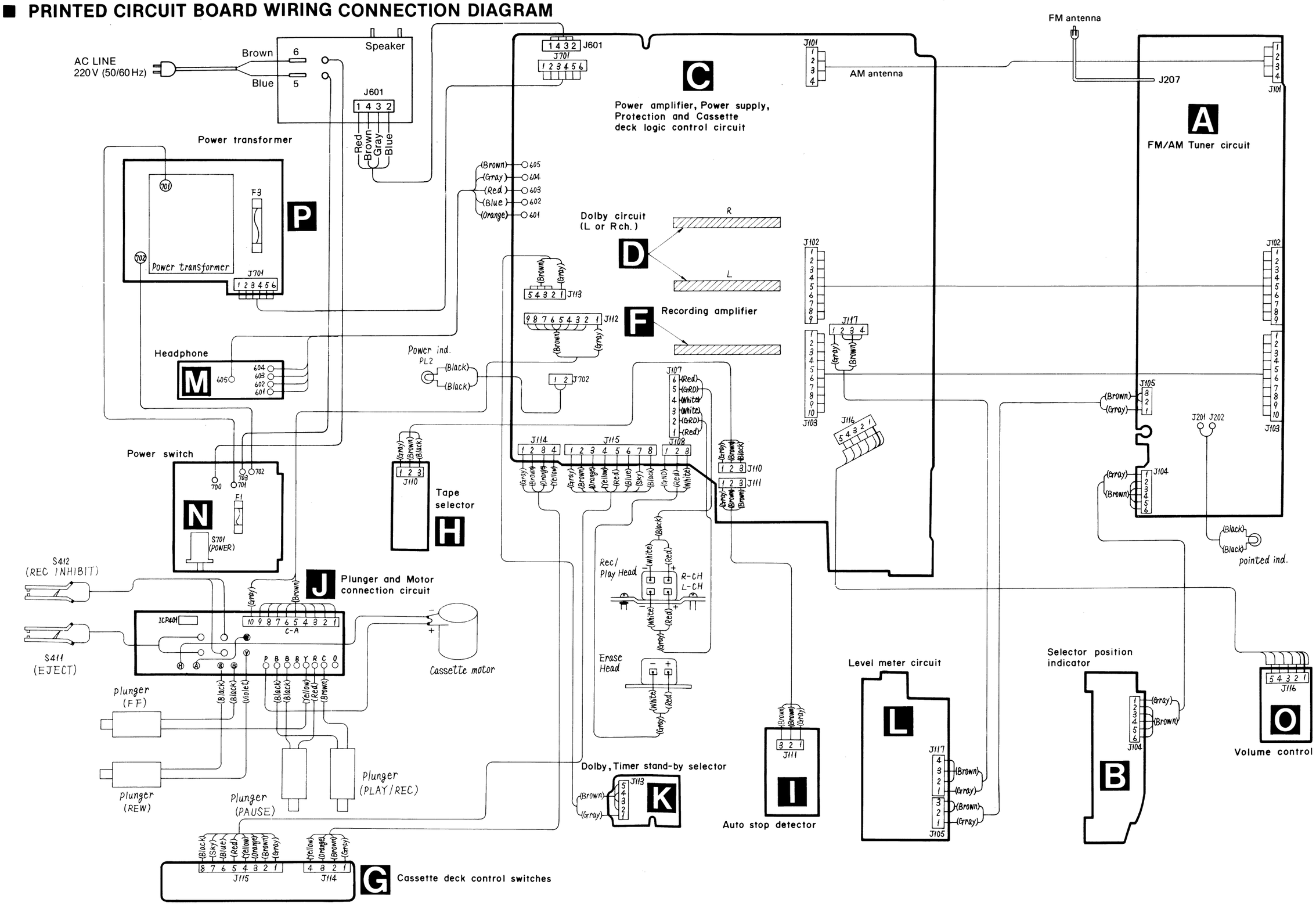


Abb. 33

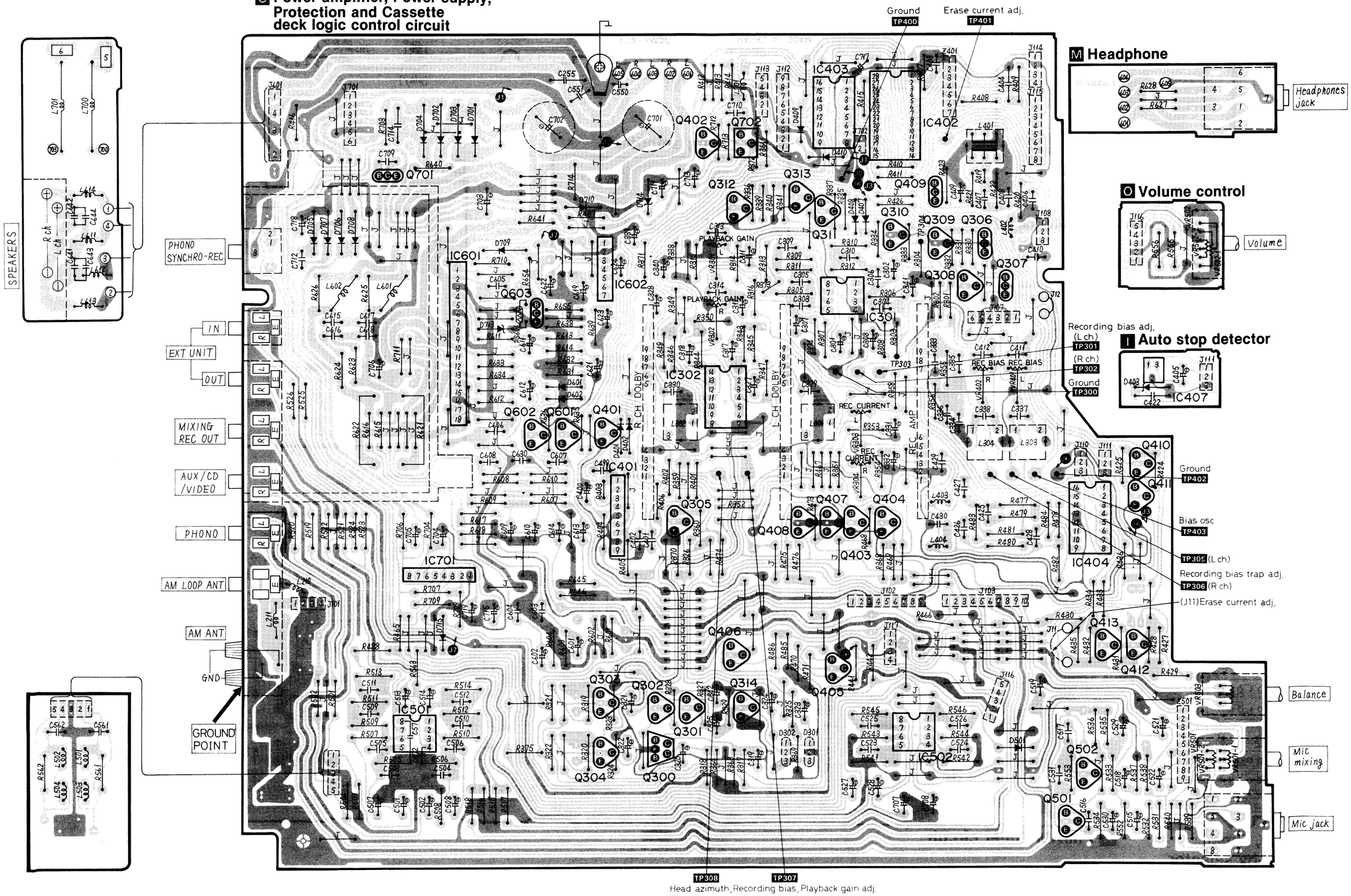
■ PRINTED CIRCUIT BOARD WIRING CONNECTION DIAGRAM



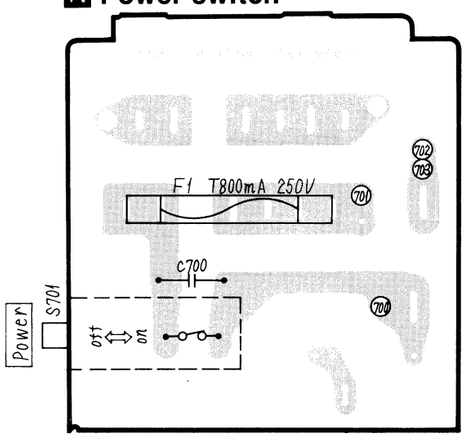
■ PRINTED CIRCUIT BOARDS

C Power amplifier, Power supply, Protection and Cassette deck logic control circuit

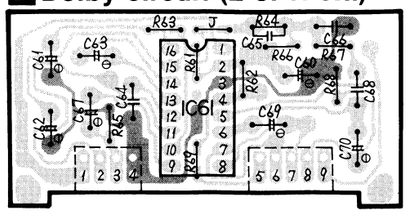
Ground (Earth) Lines



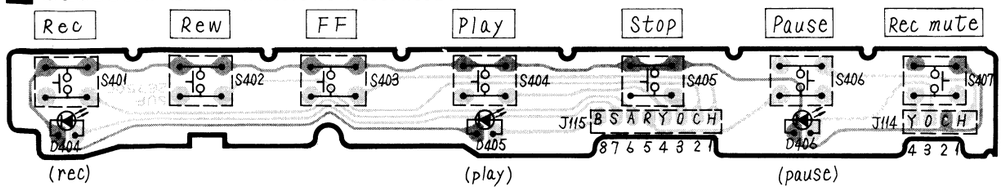
N Power switch



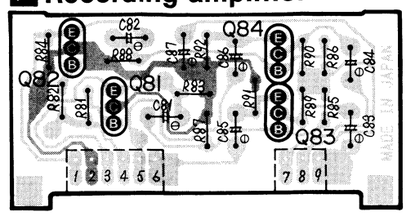
D Dolby circuit (L or R ch.)



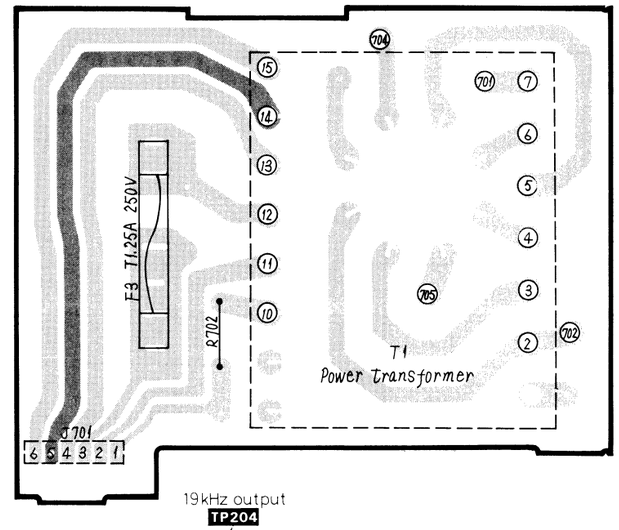
G Cassette deck control switches



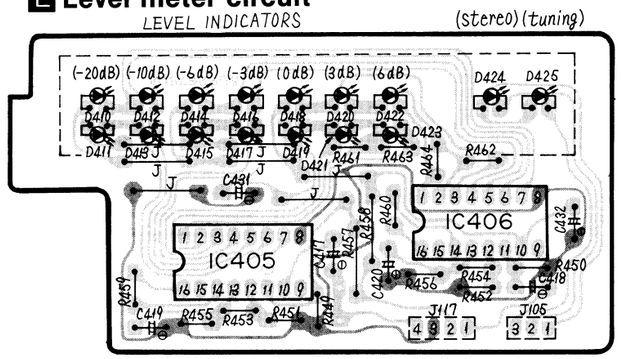
F Recording amplifier



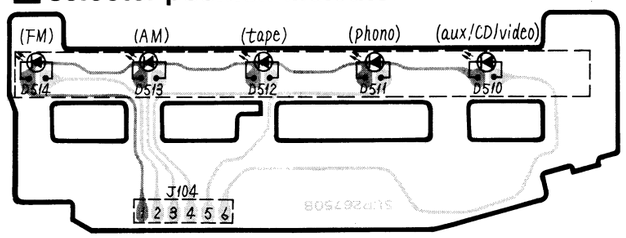
P Power transformer



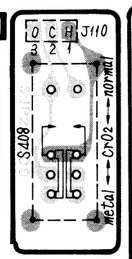
L Level meter circuit



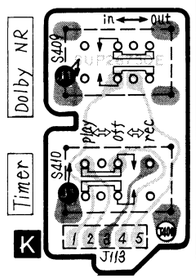
B Selector position indicator



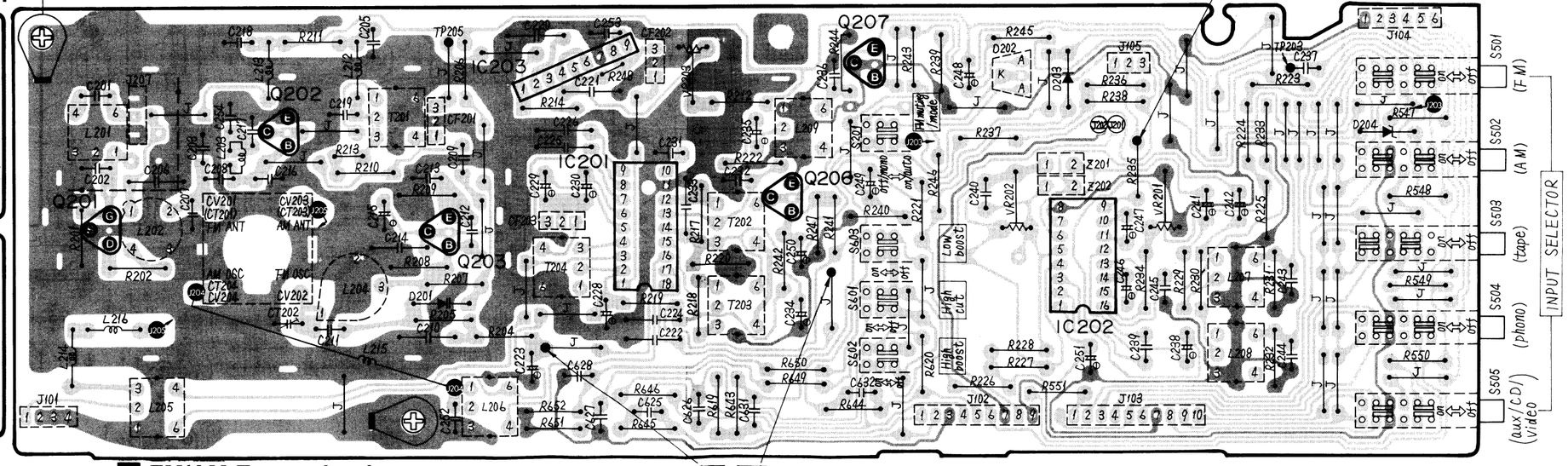
Tape selector



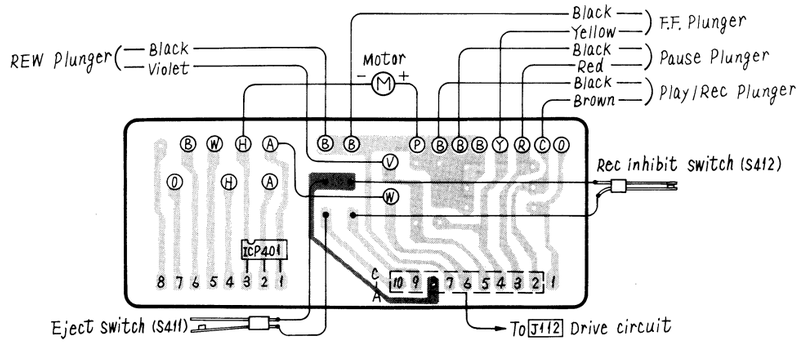
Dolby, Timer stand-by selector



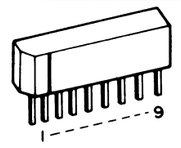
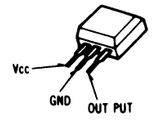
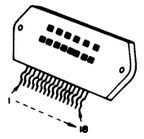
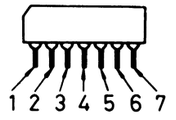
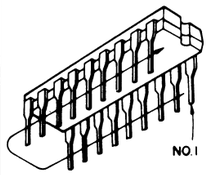
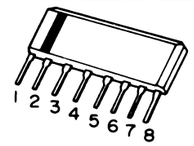
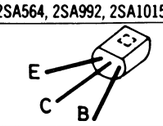
A FM/AM Tuner circuit



J Plunger, Deck motor



■ TERMINAL GUIDE OF TRANSISTORS, IC'S, AND DIODES

AN278, AN6262	DN6838	SVIK4131-2M	AN7072N
			
	AN6558F, SVINJ 4558DSM, AN6558F, SVIμPD 4066BC, SVITA 7629P, SVIμPC 1161C3 / SVIM 54530P, AN6256, AN6882, AN7273A, SVITC 9310N11	SVIM5230L 	2SC1815, 2SC1675, 2SC1685 2SC1845, 2SC1684, 2SC829 2SC1384NC 2SA564, 2SA992, 2SA1015 
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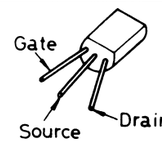	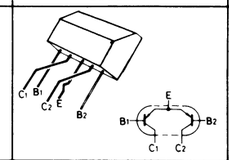	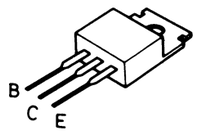	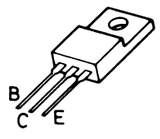
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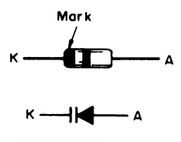
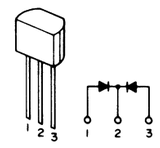
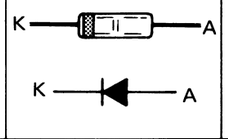
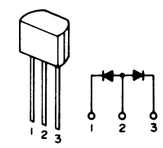
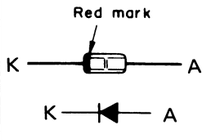
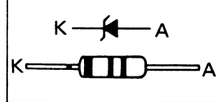
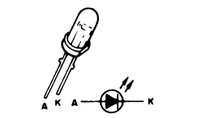
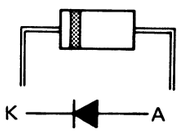
			
MA27W-A	MA1051H, MA1082 MA1056M, SVDMZ308B	SVDPR3432S, SVDAY3432S SVDBG3432S, LN81RCPH LN41YCPH, SVDAY5735S	SVDS2V20
			
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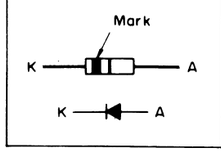
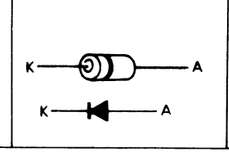
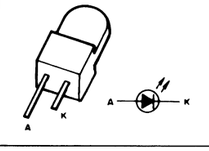
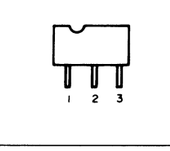
			

■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Compoents identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is OHM (Ω). K = 1000Ω, M = 1000KΩ.
5. The unit of capacitance is MICROFARAD (μF). P = 10^{-6}=F
6. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

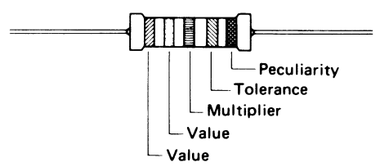
Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	F : ±1%
ERX : Metal film	14 : 1/4W	G : ±2%
ERO : Metal film	25 : 1/4W	J : ±5%
ERC : Solid	S1 : 1/4W	K : ±10%
ERD10TL : Chip type carbon	2A : 2W 2F : 1/4W	

★ **ECB type capacitor**



Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	C : ±0.25pF
ECCD : Ceramic	1C : 16V	ECQP1 : 100V	D : ±0.5pF
ECKD : Ceramic	1E : 25V	KC : 400V AC	J : ±5%
ECQM : Polyester	1V : 35V		K : ±10%
ECQP : Polypropylene	1H : 50V		Z : +80%, −20%
ECBT : Axial Leaded Type Ceramic	50 : : 50V 25 : 25V		P : +100%, −0%

● RESISTORS

Ref. No.		Part No.	Value
R61(×2)		ERD10TLJ154U	150K
R62(×2)		ERD10TLJ104U	100K
R63(×2)		ERD10TLJ274U	270K
R64(×2)		ERD10TLJ473U	47K
R65(×2)		ERD10TLJ104U	100K
R66(×2)		ERD10TLJ322U	3.3K
R67(×2)		ERD10TLJ181U	180
R68(×2)		ERD10TLJ104U	100K
R69(×2)		ERD10TLJ102U	1K
R81,82		ERD10TLJ222U	2.2K
R83,84		ERD10TLJ823U	82K
R85,86		ERD10TLJ274U	270K
R87,88		ERD10TLJ273U	27K
R89,90		ERD10TLJ822U	8.2K
R91,92		ERD10TLJ681U	680
R201	Ⓢ	ERD25FJ271	270
R202	Ⓢ	ERD25FJ220	22
R203	Ⓢ	ERD25TJ474	470K
R204	Ⓢ	ERD25TJ105	1M
R205	Ⓢ	ERD25TJ474	470K
R206	Ⓢ	ERD25FJ222	2.2K
R207	Ⓢ	ERD25TJ333	33K
R208	Ⓢ	ERD25FJ103	10K
R209	Ⓢ	ERD25FJ102	1K
R210	Ⓢ	ERD25TJ824	820K
R211	Ⓢ	ERD25FJ681	680
R212	Ⓢ	ERD25FJ102	1K
R213	Ⓢ	ERD25TJ474	470K
R214	Ⓢ	ERD25FJ471	470
R215	Ⓢ	ERD25FJ681	680
R216	Ⓢ	ERD25FJ182	1.8K

Ref. No.		Part No.	Value
R217	Ⓢ	ERD25FJ472	4.7K
R218	Ⓢ	ERD25FJ272	2.7K
R219	Ⓢ	ERD25FJ182	1.8K
R220	Ⓢ	ERD25FJ821	820
R221	Ⓢ	ERD25FJ561	560
R222	Ⓢ	ERD25TJ153	15K
R223	Ⓢ	ERD25FJ102	1K
R224	Ⓢ	ERD25TJ123	12K
R225	Ⓢ	ERD25TJ104	100K
R226	⚠	ERDS1FJ820	82
R227,228	Ⓢ	ERD25TJ153	15K
R229,230	Ⓢ	ERD25FJ332	3.3K
R231,232	Ⓢ	ERD25TJ104	100K
R233	Ⓢ	ERD25FJ103	10K
R234	Ⓢ	ERD25TJ153	15K
R235	Ⓢ	ERD25FJ102	1K
R236	Ⓢ	ERD25FJ821	820
R237	Ⓢ	ERD25FJ561	560
R238	Ⓢ	ERD25FJ821	820
R239,240	Ⓢ	ERD25FJ103	10K
R241	Ⓢ	ERD25TJ104	100K
R242	Ⓢ	ERD25FJ102	1K
R243	Ⓢ	ERD25FJ103	10K
R244	Ⓢ	ERD25TJ104	100K
R245	Ⓢ	ERD25FJ103	10K
R246	Ⓢ	ERD25TJ473	47K
R247	Ⓢ	ERD25FJ822	8.2K
R248	Ⓢ	ERD25FJ331	330
R301,302	Ⓢ	ERD25FJ100	10
R303,304	Ⓢ	ERD25TJ184	180K

Ref. No.		Part No.	Value
R230	Ⓢ	ERD25FJ561	560
R305,306	Ⓢ	ERD25TJ474	470K
R307,308	Ⓢ	ERD25FJ121	120
R309,310	Ⓢ	ERD25TJ153	15K
R311,312	Ⓢ	ERD25TJ394	390K
R313,314	Ⓢ	ERD25FJ332	3.3K
R315,316	Ⓢ	ERD25FJ392	3.9K
R317,318	Ⓢ	ERD25TJ394	390K
R319,320	Ⓢ	ERD25TJ684	680K
R321,322	Ⓢ	ERD25FJ472	4.7K
R323,324	Ⓢ	ERD25FJ102	1K
R325,326	Ⓢ	ERD25FJ472	4.7K
R327,328	Ⓢ	ERD25FJ472	4.7K
R329		ERC14GJ106	10M
R330	Ⓢ	ERD25FJ561	560
R331,332	Ⓢ	ERD25FJ472	4.7K
R333,334	Ⓢ	ERD25FJ102	1K
R335	Ⓢ	ERD25FJ102	1K
R336	Ⓢ	ERD25FJ562	5.6K
R337	Ⓢ	ERD25FJ222	2.2K
R338	Ⓢ	ERD25TJ223	22K
R339	Ⓢ	ERD25FJ103	10K
R340	Ⓢ	ERD25TJ223	22K
R341	Ⓢ	ERD25FJ472	4.7K
R343,344	Ⓢ	ERD25TJ104	100K
R345,346	Ⓢ	ERD25TJ104	100K
R347,348	Ⓢ	ERD25TJ104	100K
R349,350	Ⓢ	ERD25FJ102	1K
R351,352	Ⓢ	ERD25FJ562	5.6K
R353,354	Ⓢ	ERD25FJ272	2.7K

Ref. No.		Part No.	Value
R355,356	Ⓢ	ERD25FJ103	10K
R358	Ⓢ⚠	ERD25FJ221	220
R359,360	Ⓢ	ERD25FJ103	10K
R361	Ⓢ	ERD25FJ472	4.7K
R363,364	Ⓢ	ERD25FJ103	10K
R368	Ⓢ	ERD25FJ222	2.2K
R369,370	Ⓢ	ERD25TJ223	22K
R371,372	Ⓢ	ERD25TJ273	27K
R373	Ⓢ	ERD25TJ183	18K
R374	Ⓢ	ERD25TJ183	18K
R375	Ⓢ	ERD25FJ152	1.5K
R401,402	Ⓢ	ERD25TJ223	22K
R403	Ⓢ	ERD25TJ154	150K
R404	⚠	ERD2FCG390	39
R405,406	Ⓢ	ERD25FJ103	10K
R407		ERO25CKF3002	30K
R408	Ⓢ	ERD25FJ103	10K
R409	Ⓢ	ERD25FJ101	100
R410	Ⓢ	ERD25FJ820	82
R411	Ⓢ	ERD25FJ680	68
R412	Ⓢ	ERD25FJ102	1K
R413,414	Ⓢ	ERD25FJ103	10K
R415	Ⓢ	ERD25FJ152	1.5K
R416	Ⓢ	ERD25FJ103	10K
R419	Ⓢ⚠	ERD25FJ100	10
R420	Ⓢ	ERD25FJ2R2	2.2
R421	Ⓢ	ERD25FJ472	4.7K
R422	Ⓢ	ERD25FJ152	1.5K
R423	⚠	ERDS1FJ100	10
R424	Ⓢ	ERD25TJ563	56K

Ref. No.		
R425	Ⓢ	ERD
R426	Ⓢ	ERD
R427	Ⓢ	ERD
R428	Ⓢ⚠	ERD
R429	Ⓢ⚠	ERD
R430	Ⓢ⚠	ERD
R431,432	Ⓢ	ERD
R433,434	Ⓢ	ERD
R435	Ⓢ⚠	ERD
R436	Ⓢ⚠	ERD
R441,442	Ⓢ	ERD
R449,450	Ⓢ	ERD
R451,452	Ⓢ⚠	ERD
R453,454	Ⓢ⚠	ERD
R455,456	Ⓢ	ERD
R457,458	⚠	ERD
R459,460	Ⓢ	ERD
R461,462	Ⓢ	ERD
R463,464	Ⓢ	ERD
R465,466	⚠	ERD
R467,468	Ⓢ	ERD
R469	Ⓢ	ERD
R470	Ⓢ	ERD
R471	Ⓢ	ERD
R473,474	Ⓢ	ERD
R475,476	Ⓢ	ERD

CAPACITOR

Ref. No.		
C60(×2)	Ⓢ	ECI
C61(×2)	Ⓢ	ECI
C62(×2)	Ⓢ	ECI
C63(×2)	Ⓢ	ECI
C64(×2)		ECI
C65(×2)		ECI
C66(×2)	Ⓢ	ECI
C67(×2)	Ⓢ	ECI
C68(×2)		ECI
C69(×2)	Ⓢ	ECI
C70(×2)	Ⓢ	ECI
C81,82	Ⓢ	ECI
C83,84	Ⓢ	ECI
C85,86	Ⓢ	ECI
C87	Ⓢ	ECI
C201	Ⓢ	ECI
C202	Ⓢ	ECI
C203	Ⓢ	ECI
C205	Ⓢ	ECI
C206		ECI
C207	Ⓢ	ECI
C208	Ⓢ	ECI
C209	Ⓢ	ECI
C210		ECI
C211	Ⓢ	ECI
C212	Ⓢ	ECI
C213	Ⓢ	ECI
C214		ECI
C215	Ⓢ	ECI
C216	Ⓢ	ECI
C217	Ⓢ	ECI
C218	Ⓢ	ECI
C219	Ⓢ	ECI
C220		ECI
C221,222		ECI
C223	Ⓢ	ECI
C224		ECI
C225,226		ECI
C227		ECI
C228	Ⓢ	ECI
C229	Ⓢ	ECI
C230	Ⓢ	ECI

■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Compoents identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is OHM (Ω). K = 1000Ω, M = 1000KΩ.
5. The unit of capacitance is MICROFARAD (μF). P = 10^{-6}=F
6. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	F : ±1%
ERX : Metal film	14 : 1/4W	G : ±2%
ERO : Metal film	25 : 1/4W	J : ±5%
ERC : Solid	S1 : 1/4W	K : ±10%
ERD10TL : Chip type carbon	2A : 2W 2F : 1/4W	

★ **ECB type capacitor**

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	C : ±0.25pF
ECCD : Ceramic	1C : 16V	ECQP1 : 100V	D : ±0.5pF
ECKD : Ceramic	1E : 25V	KC : 400V AC	J : ±5%
ECQM : Polyester	1V : 35V		K : ±10%
ECQP : Polypropylene	1H : 50V		Z : +80%, −20%
ECBT : Axial Leaded Type Ceramic	50 : 50V 25 : 25V		P : +100%, −0%

● RESISTORS

Ref. No.	Part No.	Value
R61(×2)	ERD10TLJ154U	150K
R62(×2)	ERD10TLJ104U	100K
R63(×2)	ERD10TLJ274U	270K
R64(×2)	ERD10TLJ473U	47K
R65(×2)	ERD10TLJ104U	100K
R66(×2)	ERD10TLJ322U	3.3K
R67(×2)	ERD10TLJ181U	180
R68(×2)	ERD10TLJ104U	100K
R69(×2)	ERD10TLJ102U	1K
R81,82	ERD10TLJ222U	2.2K
R83,84	ERD10TLJ823U	82K
R85,86	ERD10TLJ274U	270K
R87,88	ERD10TLJ273U	27K
R89,90	ERD10TLJ822U	8.2K
R91,92	ERD10TLJ681U	680
R201 Ⓢ	ERD25FJ271	270
R202 Ⓢ	ERD25FJ220	22
R203 Ⓢ	ERD25TJ474	470K
R204 Ⓢ	ERD25TJ105	1M
R205 Ⓢ	ERD25TJ474	470K
R206 Ⓢ	ERD25FJ222	2.2K
R207 Ⓢ	ERD25TJ333	33K
R208 Ⓢ	ERD25FJ103	10K
R209 Ⓢ	ERD25FJ102	1K
R210 Ⓢ	ERD25TJ824	820K
R211 Ⓢ	ERD25FJ681	680
R212 Ⓢ	ERD25FJ102	1K
R213 Ⓢ	ERD25TJ474	470K
R214 Ⓢ	ERD25FJ471	470
R215 Ⓢ	ERD25FJ681	680
R216 Ⓢ	ERD25FJ182	1.8K
R217 Ⓢ	ERD25FJ472	4.7K
R218 Ⓢ	ERD25FJ272	2.7K
R219 Ⓢ	ERD25FJ182	1.8K
R220 Ⓢ	ERD25FJ821	820
R221 Ⓢ	ERD25FJ561	560
R222 Ⓢ	ERD25TJ153	15K
R223 Ⓢ	ERD25FJ102	1K
R224 Ⓢ	ERD25TJ123	12K
R225 Ⓢ	ERD25TJ104	100K
R226 ⚠	ERDS1FJ820	82
R227,228 Ⓢ	ERD25TJ153	15K
R229,230 Ⓢ	ERD25FJ332	3.3K
R231,232 Ⓢ	ERD25TJ104	100K
R233 Ⓢ	ERD25FJ103	10K
R234 Ⓢ	ERD25TJ153	15K
R235 Ⓢ	ERD25FJ102	1K
R236 Ⓢ	ERD25FJ821	820
R237 Ⓢ	ERD25FJ561	560
R238 Ⓢ	ERD25FJ821	820
R239,240 Ⓢ	ERD25FJ103	10K
R241 Ⓢ	ERD25TJ104	100K
R242 Ⓢ	ERD25FJ102	1K
R243 Ⓢ	ERD25FJ103	10K
R244 Ⓢ	ERD25TJ104	100K
R245 Ⓢ	ERD25FJ103	10K
R246 Ⓢ	ERD25TJ473	47K
R247 Ⓢ	ERD25FJ822	8.2K
R248 Ⓢ	ERD25FJ331	330
R301,302 Ⓢ	ERD25FJ100	10
R303,304 Ⓢ	ERD25TJ184	180K
R230 Ⓢ	ERD25FJ561	560
R305,306 Ⓢ	ERD25TJ474	470K
R307,308 Ⓢ	ERD25FJ121	120
R309,310 Ⓢ	ERD25TJ153	15K
R311,312 Ⓢ	ERD25TJ394	390K
R313,314 Ⓢ	ERD25FJ332	3.3K
R315,316 Ⓢ	ERD25FJ392	3.9K
R317,318 Ⓢ	ERD25TJ394	390K
R319,320 Ⓢ	ERD25TJ684	680K
R321,322 Ⓢ	ERD25FJ472	4.7K
R323,324 Ⓢ	ERD25FJ102	1K
R325,326 Ⓢ	ERD25FJ472	4.7K
R327,328 Ⓢ	ERD25FJ472	4.7K
R329	ERC14GJ106	10M
R330 Ⓢ	ERD25FJ561	560
R331,332 Ⓢ	ERD25FJ472	4.7K
R333,334 Ⓢ	ERD25FJ102	1K
R335 Ⓢ	ERD25FJ102	1K
R336 Ⓢ	ERD25FJ562	5.6K
R337 Ⓢ	ERD25FJ222	2.2K
R338 Ⓢ	ERD25TJ223	22K
R339 Ⓢ	ERD25FJ103	10K
R340 Ⓢ	ERD25TJ223	22K
R341 Ⓢ	ERD25FJ472	4.7K
R343,344 Ⓢ	ERD25TJ104	100K
R345,346 Ⓢ	ERD25TJ104	100K
R347,348 Ⓢ	ERD25TJ104	100K
R349,350 Ⓢ	ERD25FJ102	1K
R351,352 Ⓢ	ERD25FJ562	5.6K
R353,354 Ⓢ	ERD25FJ272	2.7K
R355,356 Ⓢ	ERD25FJ103	10K
R358 Ⓢ ⚠	ERD25FJ221	220
R359,360 Ⓢ	ERD25FJ103	10K
R361 Ⓢ	ERD25FJ472	4.7K
R363,364 Ⓢ	ERD25FJ103	10K
R368 Ⓢ	ERD25FJ222	2.2K
R369,370 Ⓢ	ERD25TJ223	22K
R371,372 Ⓢ	ERD25TJ273	27K
R373 Ⓢ	ERD25TJ183	18K
R374 Ⓢ	ERD25TJ183	18K
R375 Ⓢ	ERD25FJ152	1.5K
R401,402 Ⓢ	ERD25TJ223	22K
R403 Ⓢ	ERD25TJ154	150K
R404 ⚠	ERD2FCG390	39
R405,406 Ⓢ	ERD25FJ103	10K
R407	ERO25CKF3002	30K
R408 Ⓢ	ERD25FJ103	10K
R409 Ⓢ	ERD25FJ101	100
R410 Ⓢ	ERD25FJ820	82
R411 Ⓢ	ERD25FJ680	68
R412 Ⓢ	ERD25FJ102	1K
R413,414 Ⓢ	ERD25FJ103	10K
R415 Ⓢ	ERD25FJ152	1.5K
R416 Ⓢ	ERD25FJ103	10K
R419 Ⓢ ⚠	ERD25FJ100	10
R420 Ⓢ	ERD25FJ2R2	2.2
R421 Ⓢ	ERD25FJ472	4.7K
R422 Ⓢ	ERD25FJ152	1.5K
R423 ⚠	ERDS1FJ100	10
R424 Ⓢ	ERD25TJ563	56K
R425 Ⓢ	ERD25FJ102	1K
R426 Ⓢ	ERD25FJ222	2.2K
R427 Ⓢ	ERD25FJ472	4.7K
R428 Ⓢ ⚠	ERD25FJ221	220
R429 Ⓢ ⚠	ERD25FJ151	150
R430 Ⓢ ⚠	ERD25FJ180	18
R431,432 Ⓢ	ERD25TJ563	56K
R433,434 Ⓢ	ERD25FJ222	2.2K
R435 Ⓢ ⚠	ERD25FJ150	15
R436 Ⓢ ⚠	ERD25FJ680	68
R441,442 Ⓢ	ERD25TJ123	12K
R449,450 Ⓢ	ERD25FJ103	10K
R451,452 Ⓢ ⚠	ERD25TJ183	18K
R453,454 Ⓢ ⚠	ERD25TJ104	100K
R455,456 Ⓢ	ERD25TJ393	39K
R457,458 ⚠	ERDS1FJ101	100
R459,460 Ⓢ	ERD25FJ272	2.7K
R461,462 Ⓢ	ERD25FJ221	220
R463,464 Ⓢ	ERD25FJ221	220
R465,466 ⚠	ERD25FJ3R3	3.3
R467,468 Ⓢ	ERD25FJ103	10K
R469 Ⓢ	ERD25FJ103	10K
R470 Ⓢ	ERD25TJ223	22K
R471 Ⓢ	ERD25TJ183	18K
R473,474 Ⓢ	ERD25TJ123	12K
R475,476 Ⓢ	ERD25FJ222	2.2K
R477,478 Ⓢ	ERD25FJ332	3.3K
R479,480 Ⓢ	ERD25FJ272	2.7K
R481,482 Ⓢ	ERD25FJ102	1K
R483,484 Ⓢ	ERD25FJ182	1.8K
R485 Ⓢ	ERD25FJ392	3.9K
R486,487 Ⓢ	ERD25FJ103	10K
R488 Ⓢ	ERD25FJ102	1K
R501,502 Ⓢ	ERD25FJ152	1.5K
R503,504 Ⓢ	ERD25TJ224	220K
R505,506 Ⓢ	ERD25TJ563	56K
R507,508 Ⓢ	ERD25FJ271	270
R509,510 Ⓢ	ERD25FJ680	68
R511,512 Ⓢ	ERD25TJ184	180K
R513,514 Ⓢ	ERD25TJ123	12K
R515,516 Ⓢ	ERD25TJ104	100K
R517,518 Ⓢ	ERD25FJ102	1K
R519,520 Ⓢ	ERD25FJ472	4.7K
R521,522 Ⓢ	ERD25FJ561	560
R523,524 Ⓢ	ERD25FJ561	560
R525,526 Ⓢ	ERD25FJ102	1K
R531 Ⓢ	ERD25FJ102	1K
R532 Ⓢ	ERD25TJ123	12K
R533 Ⓢ	ERD25TJ273	27K
R534 Ⓢ	ERD25FJ221	220
R535 Ⓢ	ERD25TJ393	39K
R536 Ⓢ	ERD25TJ223	22K
R537 Ⓢ	ERD25FJ562	5.6K
R538 Ⓢ	ERD25FJ102	1K
R539,540 Ⓢ	ERD25TJ473	47K
R541,542 Ⓢ	ERD25TJ104	100K
R543,544 Ⓢ	ERD25TJ473	47K
R545,546 Ⓢ	ERD25TJ683	58K
R547,548 ⚠	ERDS1FJ471	470
R549,550 ⚠	ERD1SFJ471	470
R551 Ⓢ	ERD25FJ682	6.8K
R552 Ⓢ	ERD25TJ154	150K
R553 Ⓢ	ERD25TJ333	33K
R555,556 Ⓢ	ERD25FJ222	2.2K
R561,562 Ⓢ	ERD25FJ102	1K
R563 Ⓢ	ERD25FJ820	82
R601,602 Ⓢ	ERD25FJ102	1K
R603,604 Ⓢ	ERD25TJ563	56K
R607,608 Ⓢ	ERD25TJ123	12K
R609,610 Ⓢ	ERD25TJ473	47K
R611,612 Ⓢ	ERD25FJ222	2.2K
R613,614 Ⓢ	ERD25FJ222	2.2K
R615,616 Ⓢ	ERD25TJ223	22K
R617,618 Ⓢ	ERD25TJ332	3.3K
R619,620 Ⓢ	RD25TJ223	22K
R621,622 Ⓢ	ERX2ANJR22	0.22
R623,624 ⚠	ERDS1FJ100	10
R625,626 ⚠	ERDS1FJ100	10
R627,628 ⚠	ERDS1FJ221	220
R631,632 Ⓢ	ERD25TJ153	15K
R633 Ⓢ	ERD25FJ222	2.2K
R634 Ⓢ	ERD25FJ222	2.2K
R635,636 Ⓢ	ERD25TJ223	22K
R638 Ⓢ	ERD25TJ103	10K
R639 Ⓢ	ERD25TJ393	39K
R640 Ⓢ	ERD25TJ393	39K
R641 Ⓢ ⚠	ERD25FJ220	22
R643,644 Ⓢ	ERD25TJ824	820K
R645,646 Ⓢ	ERD25FJ182	1.8K
R647,648 Ⓢ	ERD25TJ683	68K
R649,650 Ⓢ	ERD25FJ821	820
R651,652 Ⓢ	ERD25TJ824	820K
R654 Ⓢ	ERD25TJ333	33K
R655 Ⓢ	ERD25TJ104	100K
R702 Ⓢ ⚠	ERD25FJ1R0	1
R703 Ⓢ ⚠	ERD25FJ101	100
R704 Ⓢ ⚠	ERD25FJ561	560
R706	ERO25CKF2402	24K
R707 Ⓢ	ERD25TJ183	18K
R708 Ⓢ	ERD25TJ153	15K
R709 Ⓢ	ERD25TJ332	3.3K
R710 ⚠	ERDS1FJ152	1.5K
R711 Ⓢ ⚠	ERD25FJ101	100K
R712 Ⓢ	ERD25FJ472	4.7K
R713 Ⓢ	ERD25FJ101	100
R714 ⚠	ERDS1FJ332	3.3K

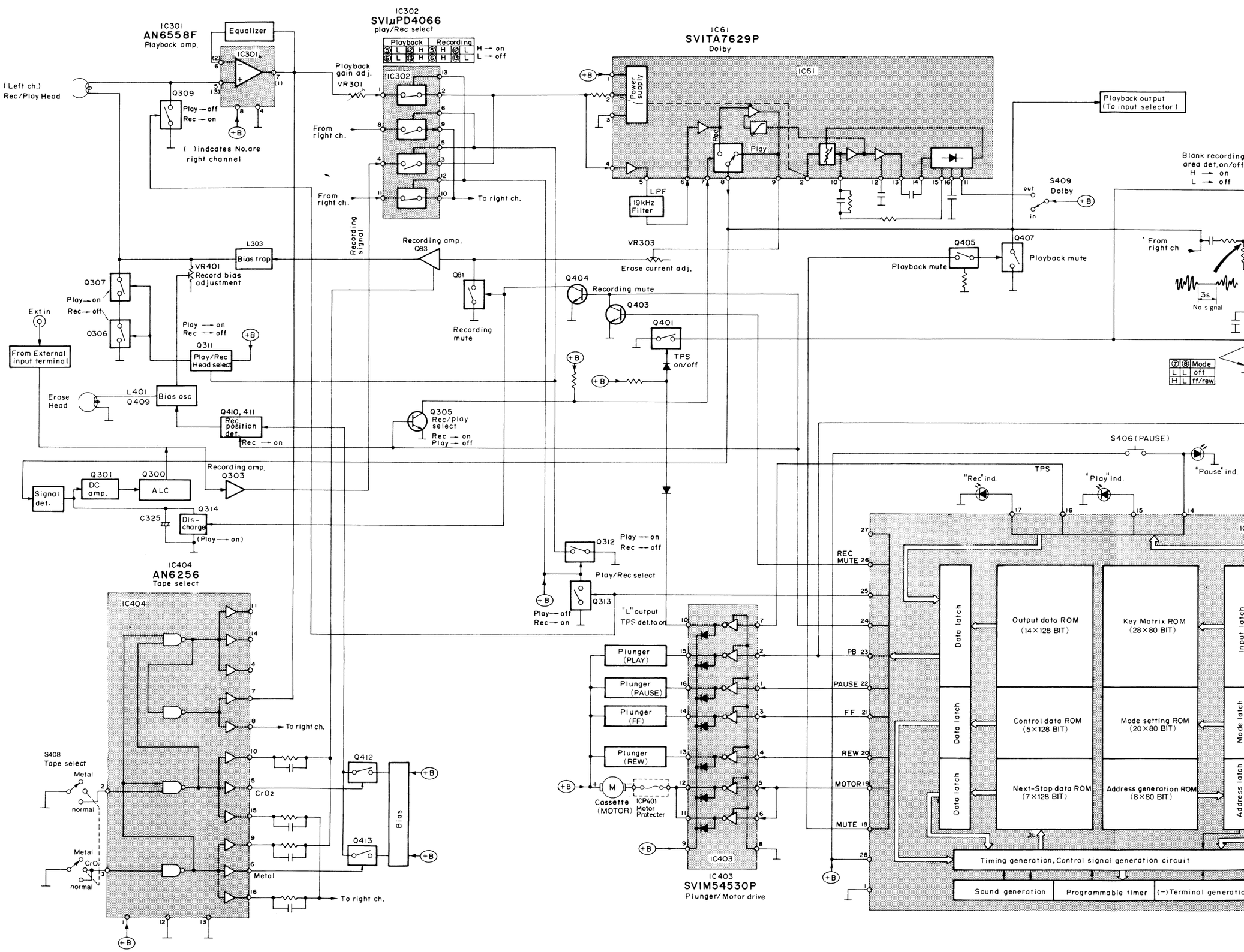
CAPACITORS

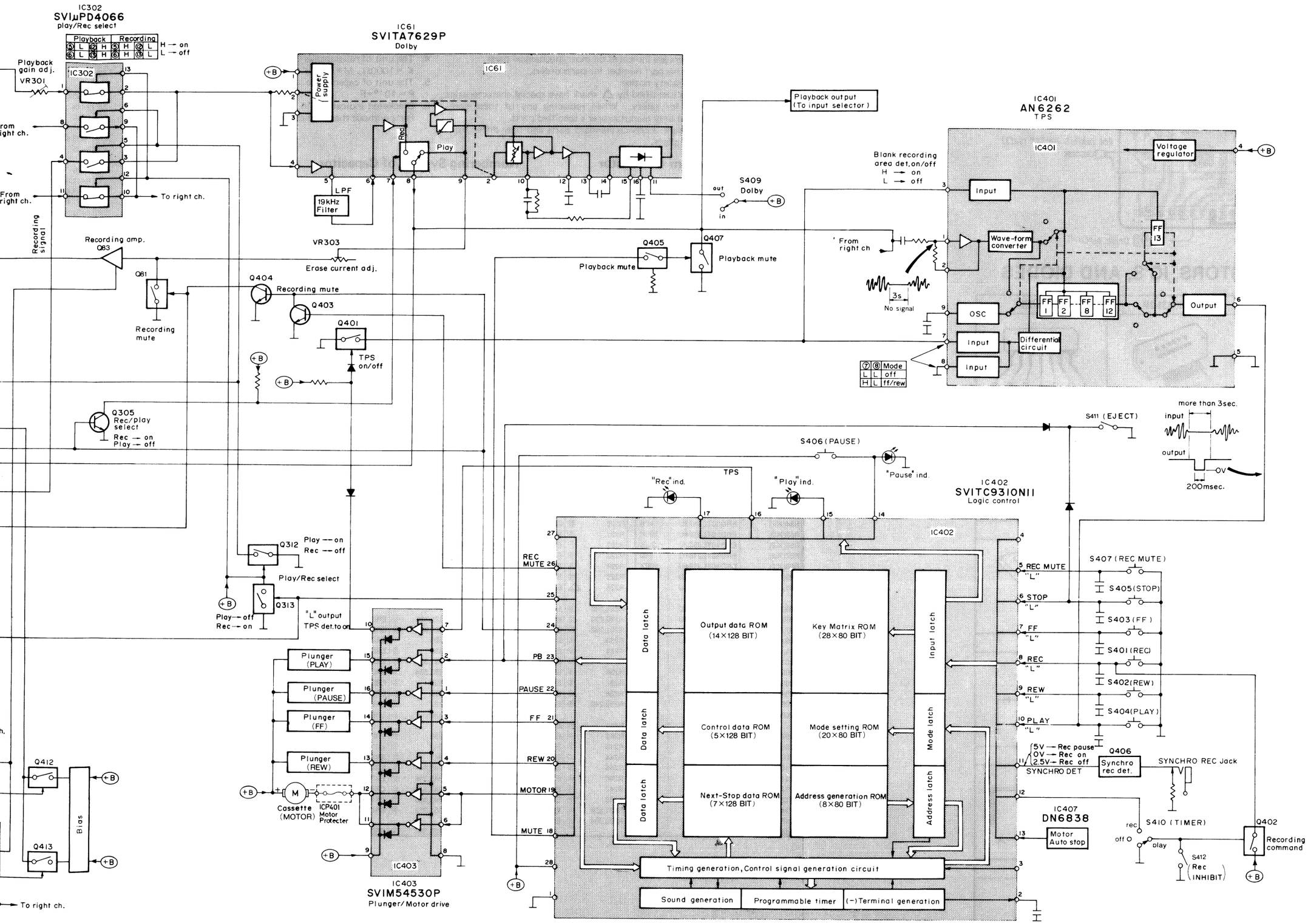
Ref. No.	Part No.	Value
C60(×2) Ⓢ	ECEA1AS221	220
C61(×2) Ⓢ	ECEA50MR33R	0.33
C62(×2) Ⓢ	ECEA50ZR1	0.1
C63(×2) Ⓢ	ECEA1HS100	10
C64(×2)	ECQM1H473KV	0.047
C65(×2)	ECQM1H472JV	0.0047
C66(×2) Ⓢ	ECQM1H273JZ	0.027
C67(×2) Ⓢ	ECEA1HS100	10
C68(×2)	ECQM1H562JV	0.0056
C69(×2) Ⓢ	ECEA1HS100	10
C70(×2) Ⓢ	ECEA1HS100	10
C81,82 Ⓢ	ECEA50ZR3R3	3.3
C83,84 Ⓢ	ECEA50ZR3R3	3.3
C85,86 Ⓢ	ECEA1HS100	10
C87 Ⓢ	ECEA1HS470	47
C201 Ⓢ	ECCD1H220K	22P
C202 Ⓢ	ECCD1H180K	18P
C203 Ⓢ	ECCD1H030CC	3P
C205 Ⓢ	ECKD1H103ZF	0.01
C206	ECBT1C103ZYY	0.01
C207 Ⓢ	ECCD1H220KC	22P
C208 Ⓢ	ECCD1H0R5CC	0.5P
C209 Ⓢ	ECCD1H010CC	1P
C210	ECBT1C223NYY	0.22
C211 Ⓢ	ECCD1H120KC	12P
C212 Ⓢ	ECCD1H390KC	39P
C213 Ⓢ	ECCD1H100KC	10P
C214	ECBT1C103ZYY	0.01
C215 Ⓢ	ECEA1CS330	33
C216 Ⓢ	ECCD1H180KC	18P
C217 Ⓢ	ECCD1H471KB	470P
C218 Ⓢ	ECKD1H103ZF	0.01
C219 Ⓢ	ECKD1H103ZF	0.01
C220	ECBT1C223NYY	0.022
C221,222	ECBT1C223NYY	0.022
C223 Ⓢ	ECEA50Z1	1
C224	ECBT1C103ZYY	0.01
C225,226	ECBT1C223NYY	0.022
C227	ECBT1C223NYY	0.022
C228 Ⓢ	ECEA1HS100	10
C229 Ⓢ	ECEA1AS101	100
C230 Ⓢ	ECEA25Z4R7	4.7
C231 Ⓢ	ECKD1H333ZF	0.033
C232 Ⓢ	ECCD1H101K	100P
C233	ECBT1C223NYY	0.022
C234 Ⓢ	ECEA25Z4R7	4.7
C235 Ⓢ	ECEA25Z4R7	4.7
C236 Ⓢ	ECCD1H101K	100P
C237	ECQM1H473KV	0.047
C238 Ⓢ	ECEA25Z4R7	4.7
C239	ECQM1H473KV	0.047
C240 Ⓢ	ECCD1H680K	68P
C241,242 Ⓢ	ECEA50ZR47	0.47
C243,244	ECQM1H822KV	0.0082
C245	ECQP1471JZ	470P
C246,247 Ⓢ	ECEA50ZR47	0.47
C248,249 Ⓢ	ECEA1HS100	10
C250 Ⓢ	ECEA1ES220	22
C251 Ⓢ	ECEA1ES101	100
C252 Ⓢ	ECCD1H060CC	6P
C253 Ⓢ	ECKD1H103ZF	0.01
C254 Ⓢ	ECKD1H471KB	470P
C255 Ⓢ	ECKD1H471KB	470P
C258 Ⓢ	ECKD1H103ZF	0.01
C301,302 Ⓢ	ECEA25M4R7R	4.7
C303,304 Ⓢ	ECKD1H471KB	470P
C305,306 Ⓢ	ECKD1H331KB	330P
C307,308 Ⓢ	ECEA1CS330	33
C309,310	ECQM1H822JV	0.0082
C311,312 Ⓢ	ECEA1HS100	10
C313,314 Ⓢ	ECQM1H183JZ	0.018
C317,318 Ⓢ	ECEA1HS100	10
C319,320 Ⓢ	ECEA50Z3R3	3.3
C321,322 Ⓢ	ECEA50ZR33	0.33
C323,324 Ⓢ	ECEA50ZR1	0.1
C325 Ⓢ	ECEA1HS100	10
C327,328 Ⓢ	ECEA50MR33R	0.33
C329,330	ECQM1H332KV	0.0033
C331,332 Ⓢ	ECEA50Z1	1
C333,334	ECQM1H222KV	0.0022
C335,336	ECQM1H182KV	0.0018
C337,338	ECQP1121JZ	120P
C339 Ⓢ	ECEA50Z2R2	2.2
C340,341 Ⓢ	ECEA1ES101	100
C342 Ⓢ	ECEA1CS330	33
C400 Ⓢ	ECEA1ES470	47
C401	ECQM1H103KV	0.01
C402	ECQM1H273KV	0.027
C403	ECQP1562JZ	5600P
C404	ECBT1C103ZYY	0.01
C405 Ⓢ	ECEA50Z3R3	3.3
C406	ECQM1H153JV	0.015
C407	ECQM1H153KV	0.015
C408	ECQM1H472KV	0.0047
C409 Ⓢ	ECEA50Z1	1
C410 Ⓢ	ECEA1ES470	47
C411,412 Ⓢ	ECCD1H101K	100P
C417,418 Ⓢ	ECEA50Z1	1
C419,420 Ⓢ	ECEA1HS100	10
C422	ECBT1C103ZYY	0.01
C425,426	ECQM1H563KV	0.056
C427,428	ECQM1H683KV	0.068
C429,430	ECQM1H393JV	0.039
C431,432 Ⓢ	ECEA1HS470	47
C499 Ⓢ	ECCD1H470K	47P
C501,502 Ⓢ	ECEA50Z3R3R	3.3
C503,504 Ⓢ	ECCD1H470K	47P
C505,506 Ⓢ	ECKD1H102ZF	0.001
C507,508 Ⓢ	ECEA1CS330	33
C509,510	ECQM1H223KV	0.022
C511,512	ECQM1H682KV	0.0088
C513,514 Ⓢ	ECEA50Z1	1
C515 Ⓢ	ECEA25Z4R7	4.7
C516 Ⓢ	ECKD1H102ZF	0.001
C517 Ⓢ	ECCD1H470K	47P
C518 Ⓢ	ECEA50Z1	1
C519 Ⓢ	ECEA1CS470	47
C521,522 Ⓢ	ECEA50Z3R3	3.3
C523,524 Ⓢ	ECCD1H470K	47P
C525,526 Ⓢ	ECCD1H270K	27P
C527,528 Ⓢ	ECEA50Z3R3	3.3
C529 Ⓢ	ECEA1ES220	22
C530 Ⓢ	ECEA1ES470	47
C531 Ⓢ	ECCD1H221K	220P
C550,551 Ⓢ	ECKD1H102MD	0.001
C561,562 Ⓢ	ECKD1H151K	150P
C571,572 Ⓢ	ECKD1H223ZF	0.022
C573,574 Ⓢ	ECKD1H103ZF	0.01
C601,602 Ⓢ	ECEA50Z3R3	3.3
C603,604 Ⓢ	ECCD1H101K	100P
C605,606 Ⓢ	ECCD1H221K	220P
C607,608 Ⓢ	ECCD1H150K	15P
C609,610 Ⓢ	ECEA1HS100	10
C611,612 Ⓢ	ECEA1HS100	10
C613,614 Ⓢ	ECEA1HS220	22
C615,616	ECQM1H473KV	0.047
C617,618	ECQM1H473KV	0.047
C619 Ⓢ	ECEA1ES101	100
C621 Ⓢ	ECEA1HS470	47
C622 Ⓢ	ECEA1VS101	100
C623 Ⓢ	ECEA1HS4R7	4.7
C624 Ⓢ	ECEA50Z3R3	3.3
C625,626 Ⓢ	ECQM1H273JZ	0.027
C627,628	ECQM1H273KV	0.027
C630	ECQM1H473KV	0.047
C631,632 Ⓢ	ECQM1H152KV	0.0015
C641,642 Ⓢ	ECKD1H223ZF	0.02
C643,644 Ⓢ	ECKD1H102MD	0.001
C700 ⚠	ECKDKC103PF	0.01
C701,702	ECETS1VV682U	6800
C703 Ⓢ	ECEA1VS222	2200
C704 Ⓢ	ECEA1VS101	100
C705 Ⓢ	ECEA50Z1	1
C706	ECEA1HG101S	100
C707,708 Ⓢ	ECEA1HS100	10
C709,710 Ⓢ	ECKD1H103ZF	0.01
C711 Ⓢ	ECEA1ES470	47
C712	ECKD1H104KV	0.1
C713 Ⓢ	ECEA1CS330	33
C714 ⚠	ECQE1104KN	0.1
C715 Ⓢ	ECEA50Z1	1
C717 Ⓢ	ECEA1CS330	33
C718 Ⓢ	ECEA50Z1	1
C719 Ⓢ	ECEA1HS470	47

SA-K6 SA-K6

■ BLOCK DIAGRAMS

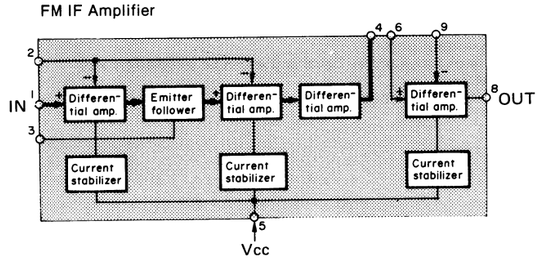
Cassette deck rec/play and Deck logic control circuit

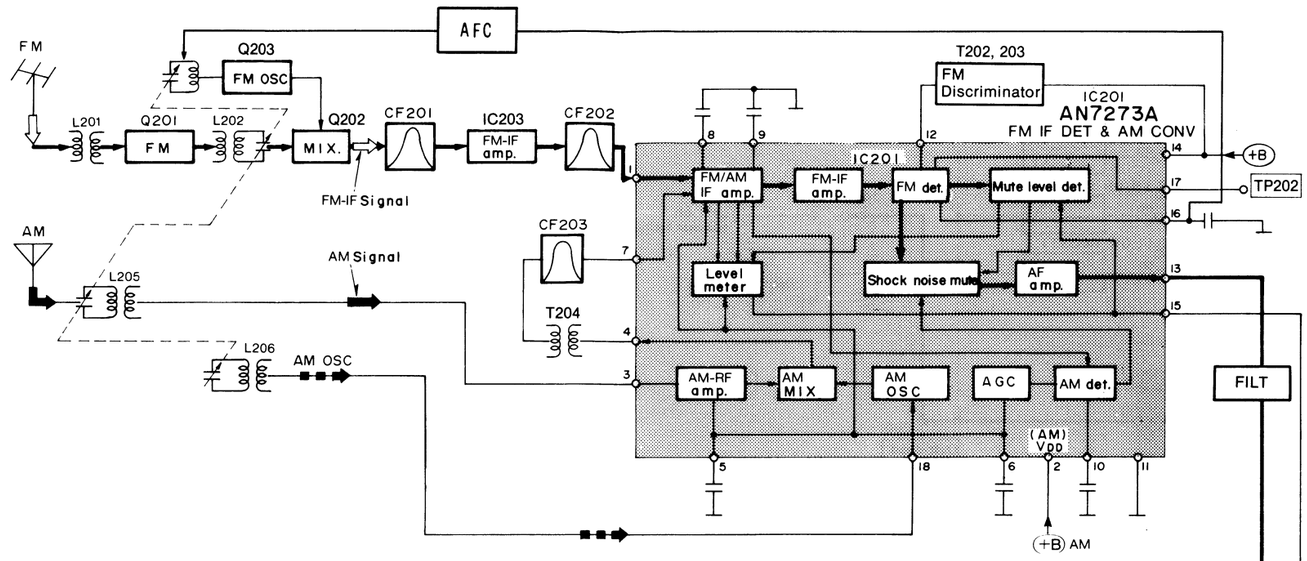


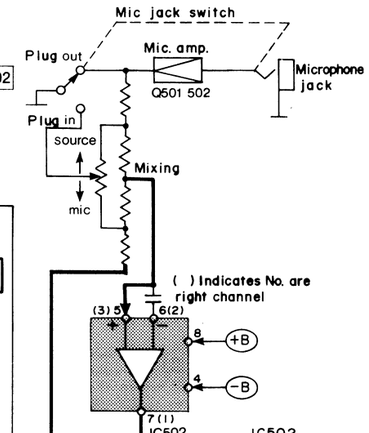

IC302
SVIμPD4066
play/Rec select
Playback
Recording
H → on
L → off
Playback gain adj.
VR301
IC302
From right ch.
To right ch.
Recording signal
IC61
SVITA7629P
Dolby
Power supply
Rec
Play
LPF
19kHz Filter
Playback output (To input selector)
S409
Dolby
out
in
IC401
AN6262
TPS
Blank recording area det.on/off
H → on
L → off
Input
Wave-form converter
Voltage regulator
FF 13
OSC
FF 1
FF 2
FF 8
FF 12
Output
Input
Input
Differential circuit
Mode
off
ff/rew
3s
No signal
Recording amp.
Q83
Q81
Recording mute
VR303
Erase current adj.
Q404
Recording mute
Q403
Q401
TPS on/off
Q405
Playback mute
Q407
Playback mute
Q305
Rec/play select
Rec → on
Play → off
Q312
Play → on
Rec → off
Play/Rec select
Q313
Play → off
Rec → on
"L" output
TPS det.to on
Plunger (PLAY)
Plunger (PAUSE)
Plunger (FF)
Plunger (REW)
Cassette (MOTOR)
ICP401 Motor Protecter
IC403
SVIM54530P
Plunger/Motor drive
S411 (EJECT)
S406 (PAUSE)
TPS
"Rec" ind.
"Play" ind.
"Pause" ind.
IC402
SVITC9310NII
Logic control
REC MUTE
PB
PAUSE
FF
REW
MOTOR
MUTE
Data latch
Output data ROM (14×128 BIT)
Key Matrix ROM (28×80 BIT)
Input latch
Control data ROM (5×128 BIT)
Mode setting ROM (20×80 BIT)
Mode latch
Next-Stop data ROM (7×128 BIT)
Address generation ROM (8×80 BIT)
Address latch
Timing generation, Control signal generation circuit
Sound generation
Programmable timer
(-)Terminal generation
REC MUTE "L"
STOP "L"
FF "L"
REC "L"
REW "L"
PLAY "L"
5V — Rec pause
0V — Rec on
2.5V — Rec off
SYNCHRO DET
Q406
Synchro rec det.
SYNCHRO REC Jack
IC407
DN6838
Motor Auto stop
rec
off
play
S410 (TIMER)
S412
Rec (INHIBIT)
Q402
Recording command
more than 3sec.
input
output
0V
200msec.
S407 (REC MUTE)
S405 (STOP)
S403 (FF)
S401 (REC)
S402 (REW)
S404 (PLAY)
Q412
Q413
Bias
To right ch.

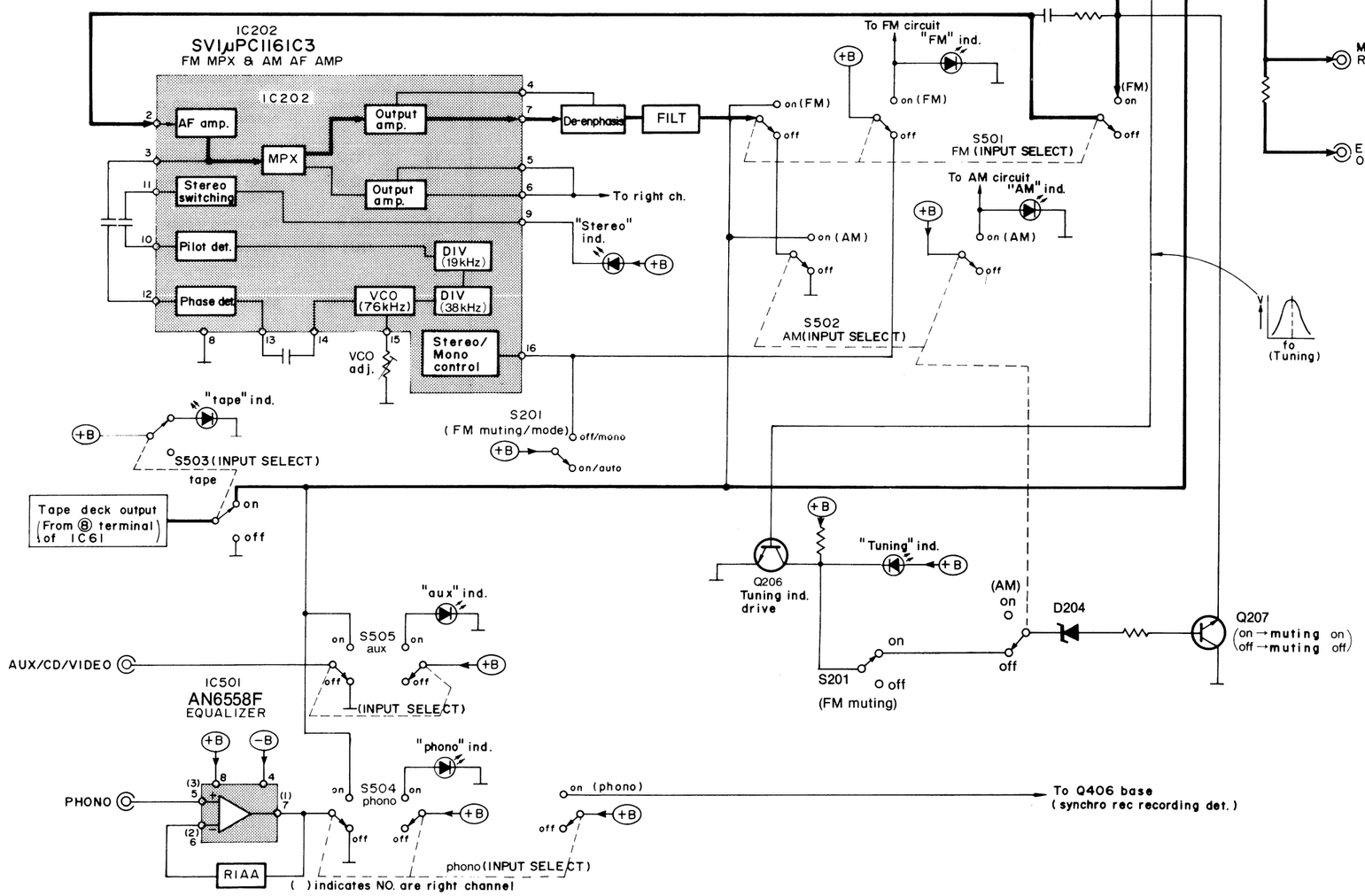
FM/AM Tuner and Input selector circuit

IC203
AN278
FM IF Amplifier

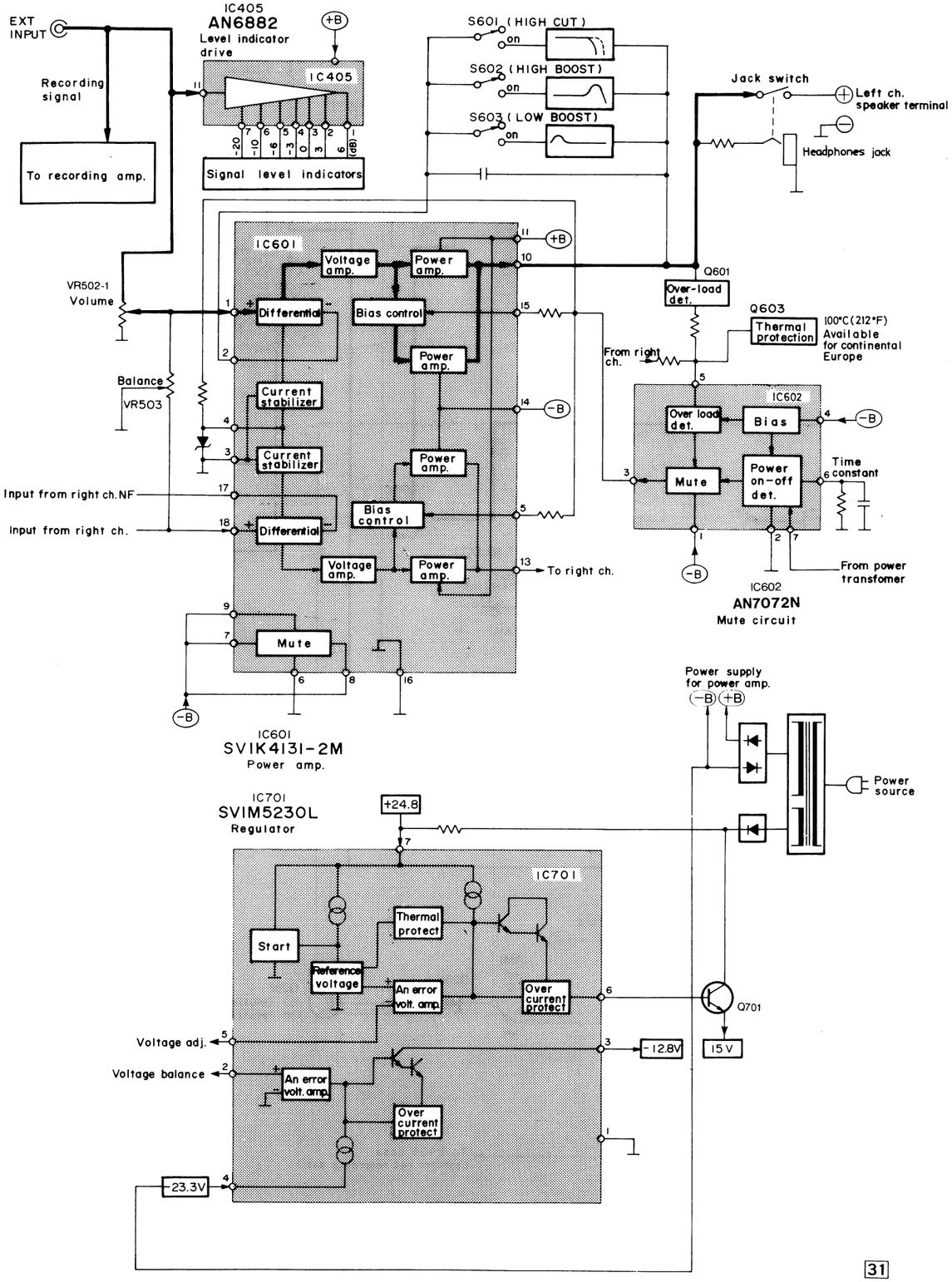








Output and Power supply circuit



■ FUNCTION OF TERMINAL
(Cassette deck logic controller IC402, SVITC9310N11)

Terminal No.	Symbol	Name of Terminal	Description
1	GND	Ground	———
2	OSC	Clock oscillation	Single-terminal oscillation circuit that oscillates clock. • Standard oscillation frequency is 128kHz.
3	CL	Not used	———
4	IN1	Not used	———
5	IN2	Mute recording command input (REC MUTE)	Used as normal input port • Either "L" level active or "H" level active can be selected by key matrix ROM data. • This unit is "L" level active.
6	IN3	Stop command (STOP)	
7	IN4	Tape fast forward command input (FF)	
8	IN5	Recording command input (REC)	
9	IN6	Tape rewinding command input	
10	IN7	Playback command input (PLAY)	
11	IN8	Synchro recording command input (SYNCRO REC DET)	Single terminal to operate 2 input ports. • Recording begins when input is 0V. • Recording stands by when input is 5V.
12	IN9	Timer standby command input (TIMER STANDBY)	Single terminal to operate 2 input ports.
13	IN10	Rotation detecting command input (RUN DET)	The number of input clocks is counted according to the command of ET (enable timer) in program.
14	I/O-1	Temporary stop command output (PAUSE)	Used as input/output port. ("H" level active) • Input → Temporary stop command • Output → Temporary stop indicator drive
15	I/O-2	Playback indicator drive output	"H" level active.
16	I/O-3	Auto cueing command output (TPS)	"H" level active.
17	I/O-4	Recording indicator drive output	"H" level active.
18	OUT-10	Playback muting command output	Inversion output port • "H" level with motor in drive mode. • "L" level with motor not in drive mode.
19	OUT-9	Motor drive command output	Inversion output port • "H" level with motor in drive mode. • "L" level with motor not in drive mode.
20	OUT-8	Tape rewind plunger drive command output	Normal output ports — bi-polar outputs. • "H" level with plunger in drive mode. • "L" level with plunger not in drive mode.
21	OUT-7	Tape fast forward plunger drive command output	
22	OUT-6	Temporary stop (PAUSE)/stop plunger drive command output	
23	OUT-5	Playback/record plunger drive command output	
24	OUT-4	Recording command output	Normal output ports — bi-polar outputs. • "H" level active.
25	OUT-3	Recording command output	
26	OUT-2	Record muting command output	• "H" level for a moment with rec switch ON. • "H" level for 3 — 4 sec. when REC MUTE switch is pressed during recording mode.
27	OUT-1	Not used.	———
28	VDD	+5.2V	———

H = more than 4.5V M = 2.5V L = 0V

Operation of "Playback" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
PLAY	H	H	H	H	H	H	M	M	Ⓐ	L	H	L	L	L	H	L	L	L	H	L	L	L	H

Operation of "Fast-forward" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
FF	H	H	H	H	H	H	M	M	Ⓐ	L	L	L	L	H	H	L	H	L	L	L	L	L	H

Operation of "Rewind" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
REW	H	H	H	H	H	H	M	M	Ⓐ	L	L	L	L	H	H	H	L	L	L	L	L	L	H

Operation of "Record" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
REC	H	H	H	H	H	H	M	M	Ⓐ	L	H	L	H	H	H	L	L	L	H	H	L	L	H

Operation of "Stop" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
STOP	H	H	H	H	H	H	M	M	L	L	L	L	L	H	L	L	L	L	L	L	L	L	H

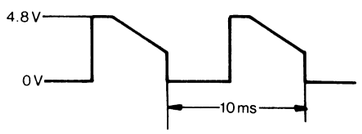
Operation of "Pause" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
PAUSE	H	H	H	H	H	H	M	M	L	H	L	L	L	H	H	L	L	H	H	L	L	L	H

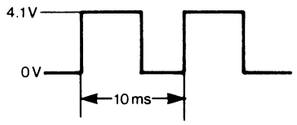
Operation of "Automatic-repeat playback" mode

MODE \ Pin No.	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉘
PLAY	H	H	H	H	H	H	M	M	Ⓐ	L	Ⓑ	L	L	L	H	L	L	L	H	L	L	L	H

Voltage of Ⓐ mark pin



Voltage of Ⓑ mark pin

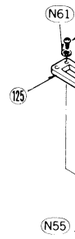


■ REPLACEMENT PARTS LIST AND EXPLODED VIEW (Cassette deck mechanism)

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. The "Ⓢ" mark is service standard parts and may differ from production parts.
3. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.		Part No.	Description	
CASSETTE DECK CHASSIS PARTS				
100		SJHRP7342CRA	R/P Head	(1)
101		SJHE321PL	Erase Head	(1)
102		SMQ4152	Spring,Head	(2)
103		SMQT1229	Head Spacer	(1)
104		SMQ4156	Head Base Pressure Plate	(1)
105		SMQ4128	Guide Pin	(1)
106		SMQ4288	Cushion,Guide Pin	(1)
107		SMQ4294	Steel Ball	(1)
108		SMQ4168	Roller	(1)
109		SMQ4154	Head Panel	(1)
110		SUS313	Spring,Erase Head	(1)
112		SMQ4132	Guide	(1)
113		SMQ4150	Switch(S412),Rec Inhight	(1)
114		SMQ4166	Take Up Idler Ass'y	(1)
115		SMQT1255	Clamper	(1)
116		SMQT1261	Bracket,P.C.B	(1)
117		SMQT1263	Bracket,P.C.B	(1)
118		SMQ4124	Clamper	(1)
119		SMQ4126	Spring	(2)
120		SMQ4134	Lever,Rec	(1)
121		SMQ4136	Spring,Rec Lever	(1)
122		SMQ4130	Guide	(1)
123		SMQ4170	Pinch Roller	(1)
124		SMQ4242	Lift Arm	(1)
125		SMQT1275	Plunger, Play	(4)
126		SMQT1251	Coil	(1)
127		SMQ4230	Arm	(1)
128		SMQT1249	Upper Base Plate	(1)
129		SMQ4226	Spring	(1)
130		SMQT1253	Coil, Pause	(1)
131		SMQ4236	Arm	(1)
132		SMQ4234	Spring	(1)
133		SMQ4238	Arm	(1)
134		SMQT1271	Gear	(1)
135		SMQ4232	Gear	(1)
136		SMQ4202	Spring,Auto Lever	(1)
137		SMQ4204	Brake Arm	(1)
138		SMQ4206	Brake Arm	(1)
139		SMQT1241	Reel	(1)
140		SMQ4174	Reel	(1)
141		SMQ4176	Spring,Back Tension	(1)
142		SMQ4186	Idler Shaft Retainer,FF	(2)
143		SMQ4210	Spring,Rew.	(1)
144		SMQ4182	Roller	(2)
145		SMQT1247	Spring	(1)
146		SMQ4208	Operation Plate	(1)

Ref. No.		Part No.	Description	
CASSETTE DECK CHASSIS PARTS				
147		SMQ4214	Idler Arm	(1)
148		SMQ4184	Spring,Operation Plate	(1)
149		SMQ4180	Operation Plate	(1)
150		SMQT1239	Reel Base Plate	(1)
151		SMQ4212	Spring,Return	(1)
152		SMQT1245	Coil, Rew	(1)
153		SMQ4224	Arm	(1)
154		SMQ4220	Spring,Gear	(2)
155		SMQT1243	Coil, ff	(1)
156		SMQ4218	Arm	(1)
157		SMQ4222	Gear,Rew.	(1)
158		SMQ4178	Take up Gear Ass'y	(1)
159		SMQ4200	Belt	(1)
160		SMQ4216	Gam Gear	(1)
161		SMQ4190	Shaft,Flywheel	(1)
162		SMQ4188	Flywheel	(1)
163		SMQ2134	Belt	(1)
164		SMQT1233	Cushion Rubber,Motor	(9)
165		SMQ4192	Cushion Plate	(1)
166		SMQ4194	Spring	(1)
167		SMQT1231	Bracket,Motor	(1)
168		SMQT1273	Motor Ass'y	(1)
169		SMQ4290	Rubber	(2)
SCREWS				
N50	S	XSN2+10	+2×10	(2)
N51		XSN2+11	+2×11	(2)
N52	S	XSN2+6	+2×6	(6)
N53	S	XSN26+5	+2.6×5	(1)
N54	S	XSN2+5	+2×5	(7)
N55	S	XSN2+4	+2×4	(15)
N56	S	XSN26+4	+2.6×4	(4)
N57	S	XSN2+8	+2×8	(2)
N58		SMQ1908		(3)
WASHERS				
N60	S	XWG2	Plain, Φ2	(1)
N61	S	XWA2B	Spring, Φ2	(10)
N62		SMQ4260		(1)
N63		SMQ4258		(3)
N64		SMQT1269		(5)
N65		SMQ3914		(2)
N66		SMQ4256		(1)
N67		SMQ4254		(1)
RETAINING RINGS				
N70		XUC3FT	Type E, Φ3	(1)
N71		XUC2FT	Type E, Φ2	(1)
N72		XUC15FT	Type E, Φ1.5	(2)



V L = 0V

㉔	㉕	㉖	㉘
L	L	L	H

㉔	㉕	㉖	㉘
L	L	L	H

㉔	㉕	㉖	㉘
L	L	L	H

㉔	㉕	㉖	㉘
H	L	L	H

㉔	㉕	㉖	㉘
L	L	L	H

㉔	㉕	㉖	㉘
L	L	L	H

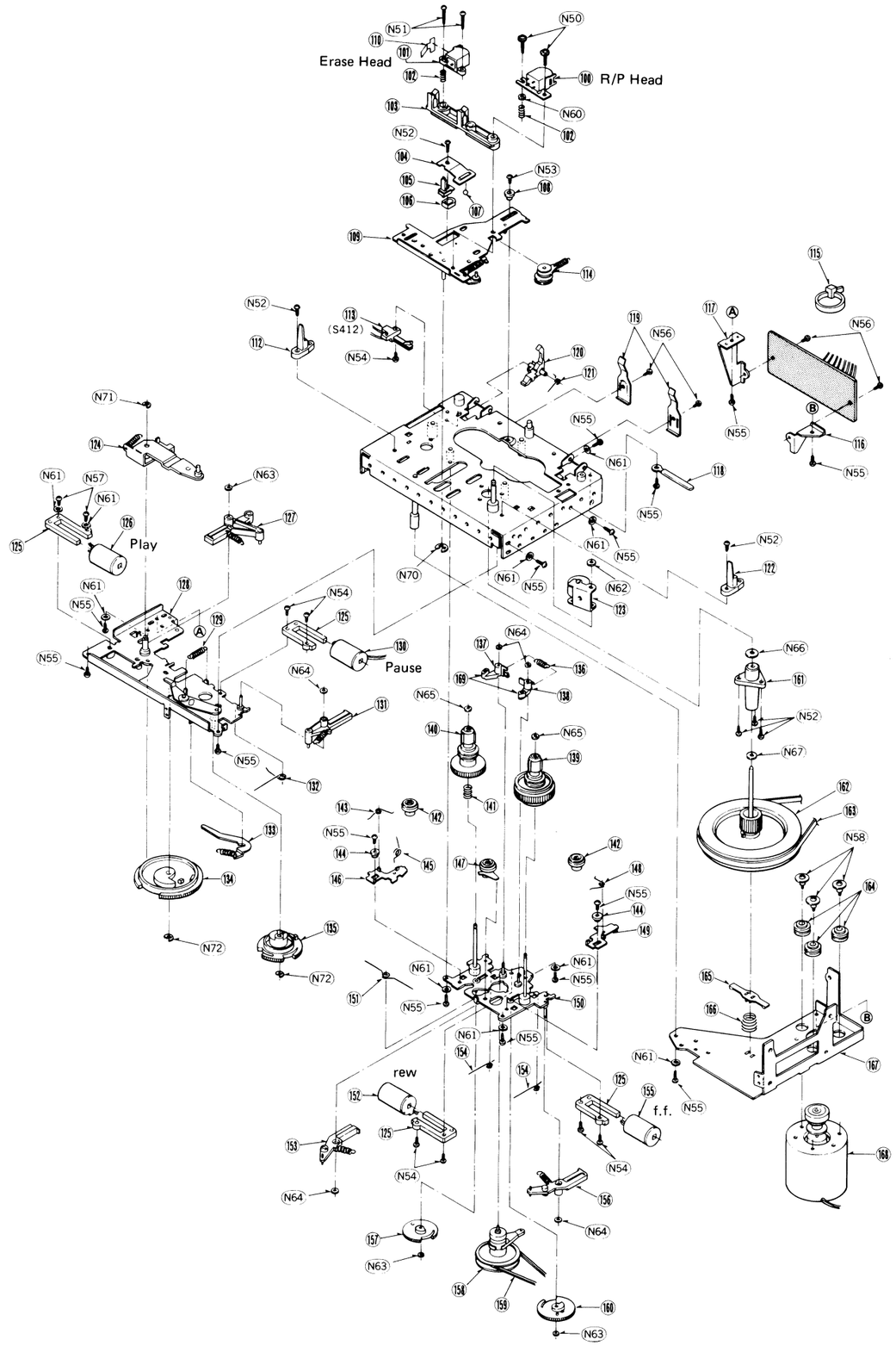
㉔	㉕	㉖	㉘
L	L	L	H

■ REPLACEMENT PARTS LIST AND EXPLODED VIEW
(Cassette deck mechanism)

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. The "Ⓢ" mark is service standard parts and may differ from production parts.
3. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description	
CASSETTE DECK CHASSIS PARTS			
100	SJHRP7342CRA	R/P Head	(1)
101	SJHE321PL	Erase Head	(1)
102	SMQ4152	Spring,Head	(2)
103	SMQT1229	Head Spacer	(1)
104	SMQ4156	Head Base Pressure Plate	(1)
105	SMQ4128	Guide Pin	(1)
106	SMQ4288	Cushion,Guide Pin	(1)
107	SMQ4294	Steel Ball	(1)
108	SMQ4168	Roller	(1)
109	SMQ4154	Head Panel	(1)
110	SUS313	Spring,Erase Head	(1)
112	SMQ4132	Guide	(1)
113	SMQ4150	Switch(S412),Rec Inhight	(1)
114	SMQ4166	Take Up Idler Ass'y	(1)
115	SMQT1255	Clamper	(1)
116	SMQT1261	Bracket,P.C.B	(1)
117	SMQT1263	Bracket,P.C.B	(1)
118	SMQ4124	Clamper	(1)
119	SMQ4126	Spring	(2)
120	SMQ4134	Lever,Rec	(1)
121	SMQ4136	Spring,Rec Lever	(1)
122	SMQ4130	Guide	(1)
123	SMQ4170	Pinch Roller	(1)
124	SMQ4242	Lift Arm	(1)
125	SMQT1275	Plunger, Play	4
126	SMQT1251	Coil	(1)
127	SMQ4230	Arm	(1)
128	SMQT1249	Upper Base Plate	(1)
129	SMQ4226	Spring	(1)
130	SMQT1253	Coil, Pause	(1)
131	SMQ4236	Arm	(1)
132	SMQ4234	Spring	(1)
133	SMQ4238	Arm	(1)
134	SMQT1271	Gear	(1)
135	SMQ4232	Gear	(1)
136	SMQ4202	Spring,Auto Lever	(1)
137	SMQ4204	Brake Arm	(1)
138	SMQ4206	Brake Arm	(1)
139	SMQT1241	Reel	(1)
140	SMQ4174	Reel	(1)
141	SMQ4176	Spring,Back Tension	(1)
142	SMQ4186	Idler Shaft Retainer,FF	(2)
143	SMQ4210	Spring,Rew.	(1)
144	SMQ4182	Roller	(2)
145	SMQT1247	Spring	(1)
146	SMQ4208	Operation Plate	(1)

Ref. No.	Part No.	Description	
CASSETTE DECK CHASSIS PARTS			
147	SMQ4214	Idler Arm	(1)
148	SMQ4184	Spring,Operation Plate	(1)
149	SMQ4180	Operation Plate	(1)
150	SMQT1239	Reel Base Plate	(1)
151	SMQ4212	Spring,Return	(1)
152	SMQT1245	Coil, Rew	(1)
153	SMQ4224	Arm	(1)
154	SMQ4220	Spring,Gear	(2)
155	SMQT1243	Coil, ff	(1)
156	SMQ4218	Arm	(1)
157	SMQ4222	Gear,Rew.	(1)
158	SMQ4178	Take up Gear Ass'y	(1)
159	SMQ4200	Belt	(1)
160	SMQ4216	Gam Gear	(1)
161	SMQ4190	Shaft,Flywheel	(1)
162	SMQ4188	Flywheel	(1)
163	SMQ2134	Belt	(1)
164	SMQT1233	Cushion Rubber,Motor	(9)
165	SMQ4192	Cushion Plate	(1)
166	SMQ4194	Spring	(1)
167	SMQT1231	Bracket,Motor	(1)
168	SMQT1273	Motor Ass'y	(1)
169	SMQ4290	Rubber	(2)
SCREWS			
N50	Ⓢ	XSN2+10	+2×10 (2)
N51		XSN2+11	+2×11 (2)
N52	Ⓢ	XSN2+6	+2×6 (6)
N53	Ⓢ	XSN26+5	+2.6×5 (1)
N54	Ⓢ	XSN2+5	+2×5 (7)
N55	Ⓢ	XSN2+4	+2×4 (15)
N56	Ⓢ	XSN26+4	+2.6×4 (4)
N57	Ⓢ	XSN2+8	+2×8 (2)
N58		SMQ1908	(3)
WASHERS			
N60	Ⓢ	XWG2	Plain, Φ2 (1)
N61	Ⓢ	XWA2B	Spring, Φ2 (10)
N62		SMQ4260	(1)
N63		SMQ4258	(3)
N64		SMQT1269	(5)
N65		SMQ3914	(2)
N66		SMQ4256	(1)
N67		SMQ4254	(1)
RETAINING RINGS			
N70		XUC3FT	Type E, Φ3 (1)
N71		XUC2FT	Type E, Φ2 (1)
N72		XUC15FT	Type E, Φ1.5 (2)



■ SCHEMATIC DIAGRAM Ⓐ

(This schematic diagram may be modified at any time the development of new technology.)

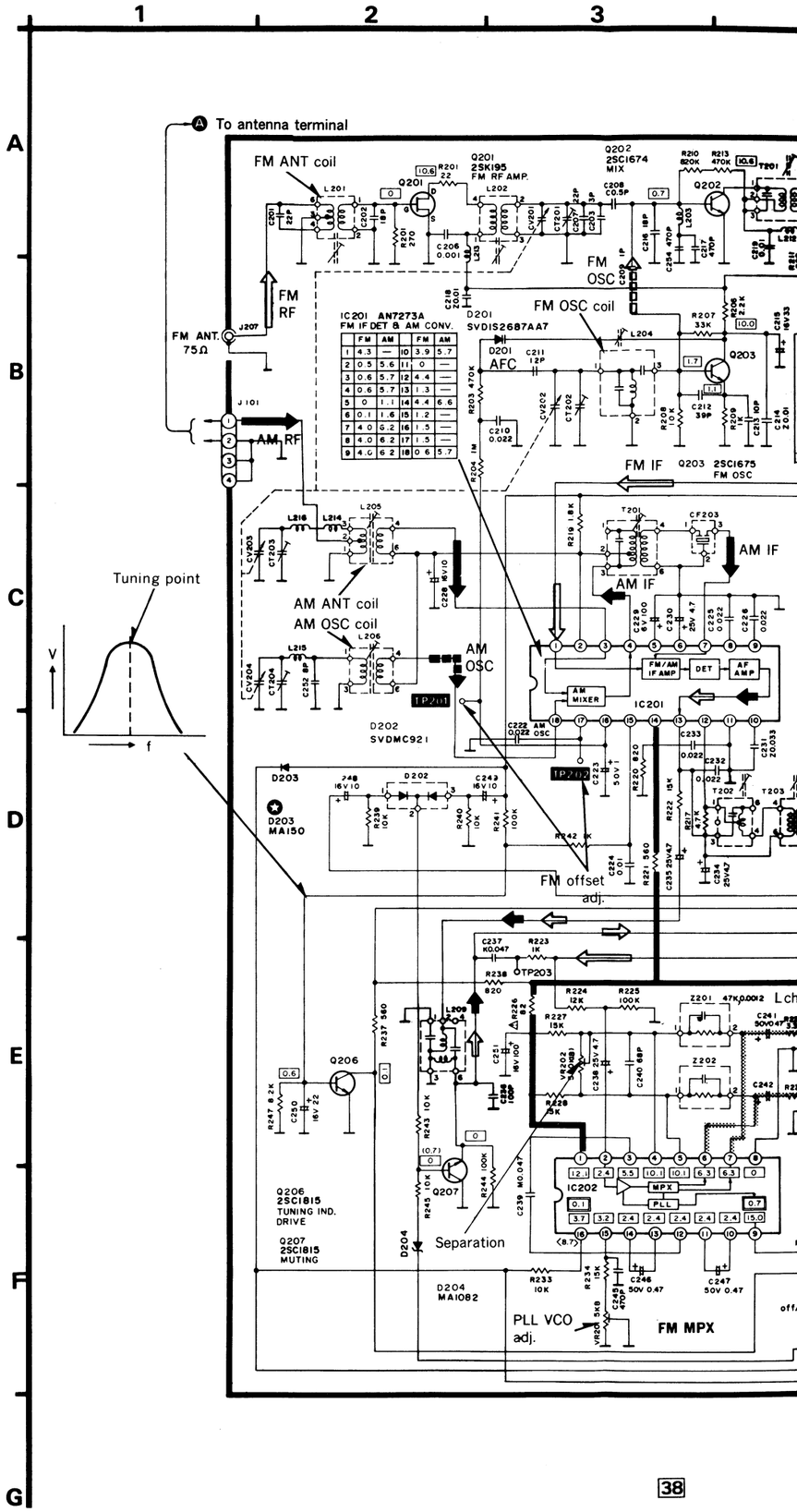
* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.

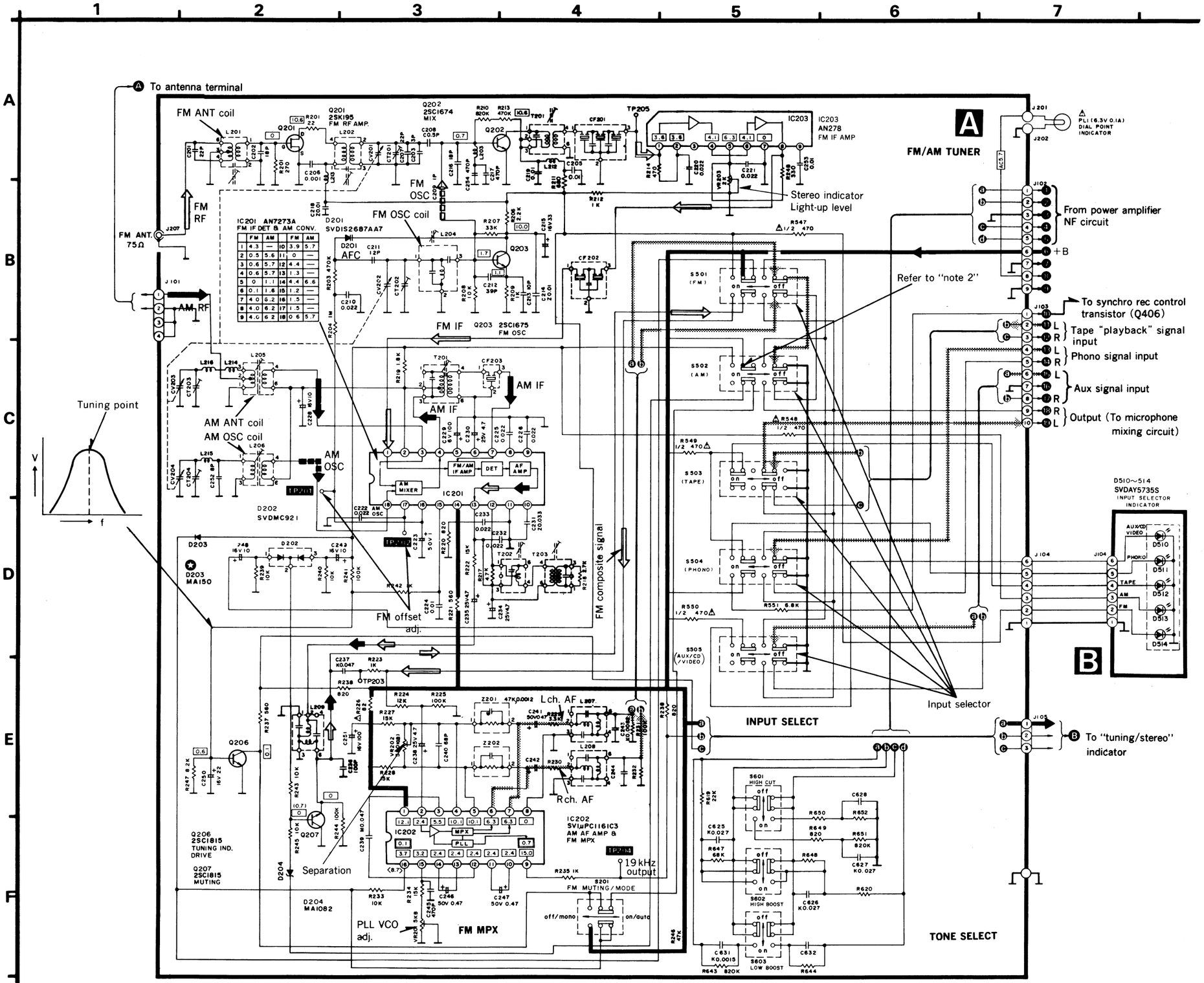
Notes 1.

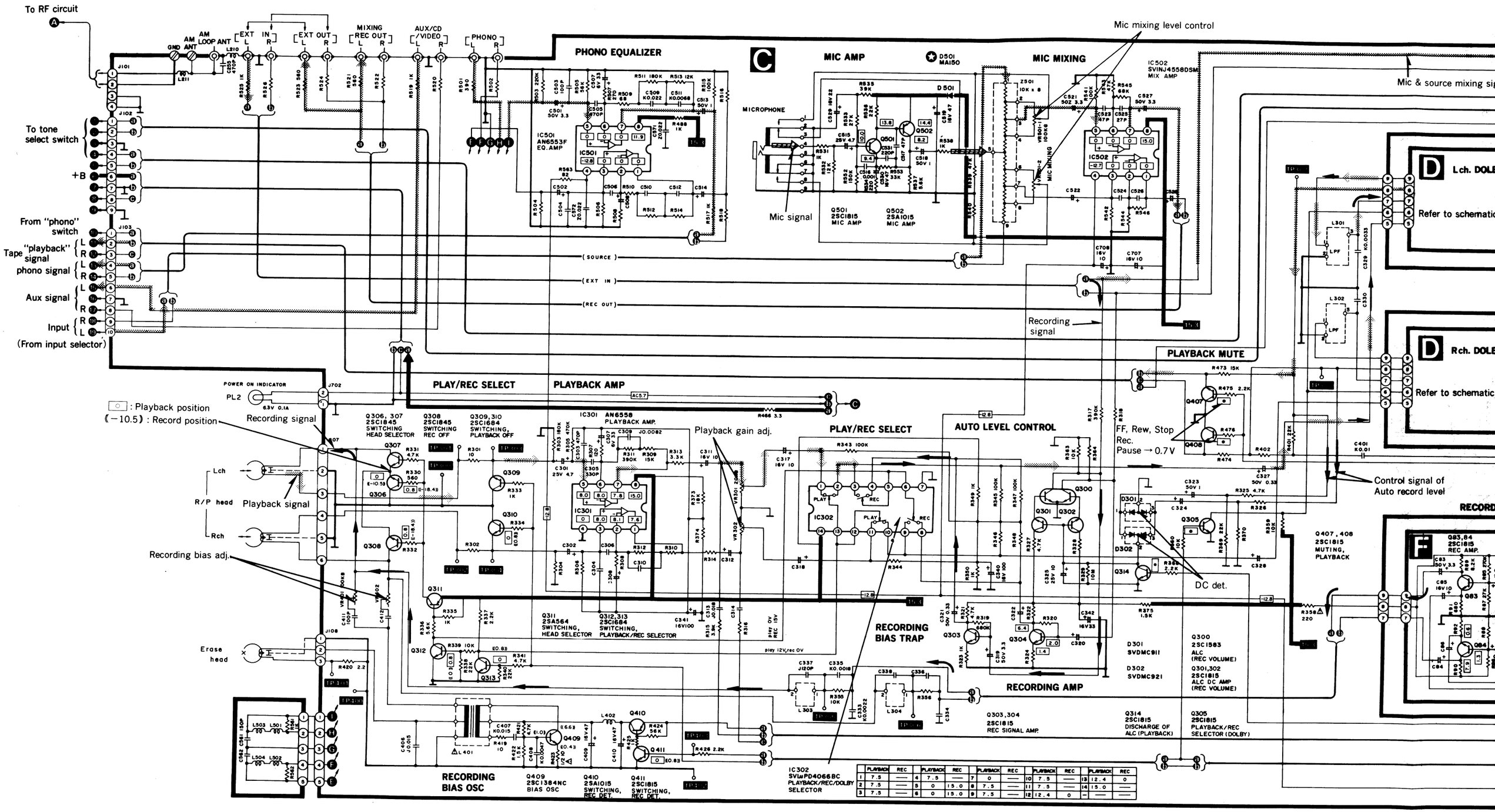
1. **S201** : FM muting/mode switch in "**on/auto**" position. (on/auto ↔ off/mono)
2. **S401** : Tape deck "**record**" switch.
3. **S402** : Tape deck "**rewind**" switch.
4. **S403** : Tape deck "**fast-forward**" switch.
5. **S404** : Tape deck "**playback**" switch.
6. **S405** : Tape deck "**stop**" switch.
7. **S406** : Tape deck "**pause**" switch.
8. **S407** : Tape deck "**recording mute**" switch.
9. **S408** : Tape selector switch in "**Metal**" position. (normal ↔ CrO_2 ↔ Metal)
10. **S409** : Dolby noise-reduction switch in "**out**" position. (out ↔ in)
11. **S410** : Tape deck "**timer**" switch in "**play**" position. (rec ↔ off ↔ play)
12. **S411** : Tape deck Eject switch in cassette holder "**open or close**" position.
13. **S412** : Tape deck Record inhibit switch in "**playback**" position.
14. **S501 ~ S505** : Input selector switch in "**tape**" position. (S501 : FM, S502 : AM, S503 : tape, S504 : phono, S505 : aux/CD/video)
15. **S601** : High cut switch in "**off**" position. (off ↔ on)
16. **S602** : High boost switch in "**off**" position. (off ↔ on)
17. **S603** : Low boost switch in "**off**" position. (off ↔ on)
18. **S701** : Power switch in "**on**" position.
19. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
    Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    * Figures in [ ] stand for DC voltage in FM mono signal reception mode and AF circuit no-signal mode.
    * Figures in [ ] stand for DC voltage in FM stereo signal reception mode.
    * Figures in ( ) stand for DC voltage in FM (no signal) muting to on mode.
    * Figures in < > stand for DV voltage in AM signal reception mode.
    * Figures in ⌜ ⌟ stand for DC voltage in AF muting circuit operation (not output).
    * Figures in [ ] stand for DC voltage in TPS circuit operation.
    * Figures in [ ] stand for DC voltage in high (6V) or low (0V).
    * Figures in [ ] stand for DC voltage in high (5V) or low (0V).
20. Signal lines
    ⇨/⇨ FM signal ➡/➡ AM signal
    Audio frequency signal or playback signal
    Positive (+B) voltage lines
    ⇢ Record signal ⇨ Microphone signal
21. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Note 2:

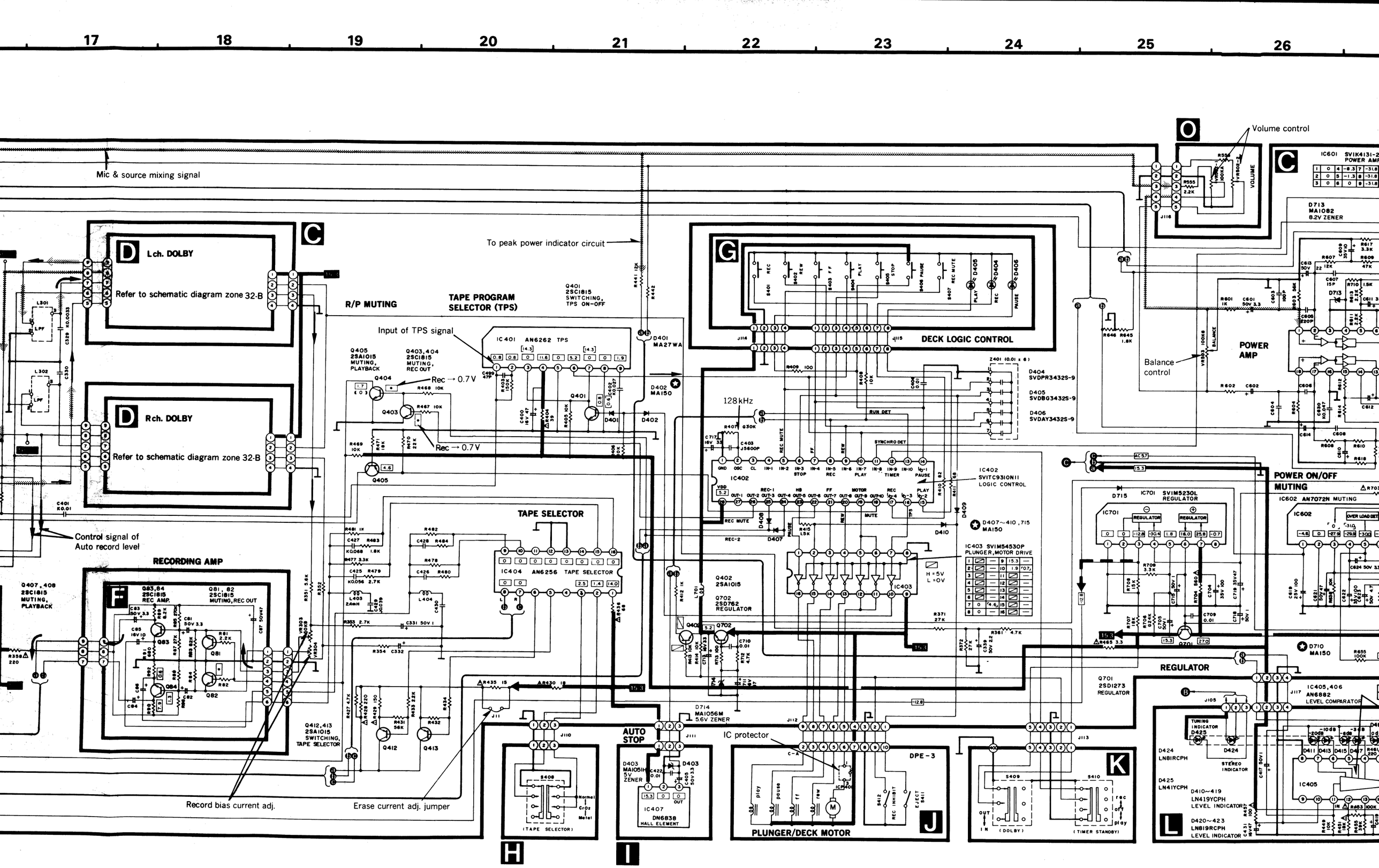
Muting switch part. When switch is turned on it is positioned as shown only for moment. Usually, it is not connected to the circuit.




To antenna terminal
FM ANT coil
FM ANT. 75Ω
J207
FM RF
AM RF
J101
Q201 2SK195 FM RF AMP.
Q202 2SC1674 MIX
FM OSC
FM OSC coil
IC201 AN7273A FM IF DET & AM CONV.
D201 SVDIS2687AA7
AFC
Q203
FM IF
Q203 2SC1675 FM OSC
IC203 AN278 FM IF AMP
TP205
Stereo indicator Light-up level
FM/AM TUNER
PLI (6.3V 0.1A) DIAL POINT INDICATOR
From power amplifier NF circuit
+B
Refer to "note 2"
To synchro rec control transistor (Q406)
Tape "playback" signal input
Phono signal input
Aux signal input
Output (To microphone mixing circuit)
D510~514 SVDAY5735S INPUT SELECTOR INDICATOR
AUX/CD/VIDEO
PHONO
TAPE
AM
FM
D510
D511
D512
D513
D514
S501 (FM)
S502 (AM)
S503 (TAPE)
S504 (PHONO)
S505 (AUX/CD/VIDEO)
Input selector
INPUT SELECT
To "tuning/stereo" indicator
Tuning point
AM ANT coil
AM OSC coil
AM OSC
AM IF
IC201
FM/AM IF AMP
DET
AF AMP
AM MIXER
D202 SVDMC921
D203 MA150
FM offset adj.
FM composite signal
Q206 2SC1815 TUNING IND. DRIVE
Q207 2SC1815 MUTING
Separation
D204 MA1082
IC202 SVμPC1161C3 AM AF AMP & FM MPX
MPX
PLL
19kHz output
S201 FM MUTING/MODE
off/mono
on/auto
PLL VCO adj.
FM MPX
Lch. AF
Rch. AF
TONE SELECT
S601 HIGH CUT
S602 HIGH BOOST
S603 LOW BOOST



	PLAYBACK	REC		PLAYBACK	REC		PLAYBACK	REC		PLAYBACK	REC		PLAYBACK	REC
1	7.5	—	4	7.5	—	7	0	—	10	7.5	—	13	12.4	0
2	7.5	—	5	0	15.0	8	7.5	—	11	7.5	—	14	15.0	—
3	7.5	—	6	0	15.0	9	7.5	—	12	12.4	0	—	—	—


Mic & source mixing signal
To peak power indicator circuit
D Lch. DOLBY
Refer to schematic diagram zone 32-B
D Rch. DOLBY
Refer to schematic diagram zone 32-B
Control signal of Auto record level
RECORDING AMP
Q83,84 2SC1815 REC AMP.
Q81, 82 2SC1815 MUTING, REC OUT
Q407, 408 2SC1815 MUTING, PLAYBACK
Q412,413 2SA1015 SWITCHING, TAPE SELECTOR
Record bias current adj.
Erase current adj. jumper
R/P MUTING
TAPE PROGRAM SELECTOR (TPS)
Q401 2SC1815 SWITCHING, TPS ON-OFF
Input of TPS signal
IC401 AN6262 TPS
Q405 2SA1015 MUTING, PLAYBACK
Q403,404 2SC1815 MUTING, REC OUT
Rec → 0.7V
Rec → 0.7V
D401 MA27WA
D402 MA150
TAPE SELECTOR
IC404 AN6256 TAPE SELECTOR
G
DECK LOGIC CONTROL
128kHz
IC402 SVITC9310N11 LOGIC CONTROL
IC403 SVIM54530P PLUNGER, MOTOR DRIVE
H=5V L=0V
Q402 2SA1015
Q702 2SD762 REGULATOR
D714 MA1056M 5.6V ZENER
D403 MA1051H 5V ZENER
IC407 DN6838 HALL ELEMENT
IC protector
PLUNGER/DECK MOTOR
DPE-3
D404 SVDPR3432S-9
D405 SVDBG3432S-9
D406 SVDAY3432S-9
O
Volume control
IC601 SVIK4131-2 POWER AMP
POWER AMP
Balance control
D713 MA1082 6.2V ZENER
POWER ON/OFF MUTING
IC602 AN7072N MUTING
IC701 SVIM5230L REGULATOR
REGULATOR
Q701 2SD1273 REGULATOR
IC405,406 AN6882 LEVEL COMPARATOR
TUNING INDICATOR D425
D424 LN81RCPH
STEREO INDICATOR
D425 LN41YCPH
D410~419 LN419YCPH LEVEL INDICATOR
D420~423 LN819RCPH LEVEL INDICATOR
D407~410, 715 MA150
D710 MA150
C
K
L
J
I
H
F

■ SCHEMATIC DIAGRAM Ⓑ

23 24 25 26 27 28 29 30 31 32

A B C D E F

O

Volume control

C

IC601 SVIK4131-2M POWER AMP

1	0	4	-8.3	7	-31.8	10	0	13	0	16	0
2	0	5	-1.3	8	-31.8	11	31.8	14	-31.8	17	0
3	0	6	0	9	-31.8	12	30.3	15	-1.3	18	0

Q406 2SC1815 SWITCHING, REC DET

H=5V M=2.5V L=0V

H → Synchro recording in "stand-by"
M → Synchro recording in "off"
L → Synchro recording in "on"

SYNCHRO REC

D713 MA1082 8.2V ZENER

OVER LOAD DETECTOR

D601,602 MA162

Q601,602 2SA992 OVER LOAD DET.

POWER AMP

Balance control

IC601

3~4s

0V

-28V

Power ON

OFF

POWER ON/OFF

MUTING

IC602 AN7072N MUTING

D715 IC701 SVIM5230L REGULATOR

REGULATOR

Q701 2SD1273 REGULATOR

D710 MA150

Q603 2SA1015 THERMAL PROTECTOR

PS601 100°C(212°F)

D705~709 SVDIS35200F RECTIFIER

D701~704 SVDS2V20 RECTIFIER

IC405,406 AN6882 LEVEL COMPARATOR

D424 LN81RCPH STEREO INDICATOR

D425 LN41YCPH TUNING INDICATOR

D410~419 LN419YCPH LEVEL INDICATOR

D420~423 LN819RCPH LEVEL INDICATOR

PEAK POWER INDICATOR

IC402 SVITC9310N11 LOGIC CONTROL

D407~410, 715 MA150

IC403 SVIM54530P PLUNGER, MOTOR DRIVE

H=5V L=0V

DECK LOGIC CONTROL

D404 SVDPR3432S-9

D405 SVDBG3432S-9

D406 SVDAY3432S-9

DPE-3

S409 (DOLBY)

S410 (TIMER STANDBY)

D

DOLBY CIRCUIT (L ch. or R ch.)

IC61 SVITA7629P DOLBY

To filter
Play out
From filter
Rec/Play cont
Input

15.3V
Dolby SW
Rec out
Ground

Recordingsignal

HEADPHONES

(Lch)
SPEAKERS
(Rch)

AC50/60Hz 220V

■ REPLACEMENT PARTS LIST (Electric parts and cabinet parts)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC61(X2)	SVITA7629P	Dolby
IC201	AN7273A	FM IF Det.& AM Converter.
IC202	SVIUPC1161C3	AM AF Amp. &FM MPX
IC203	AN278	FM IF Amp.
IC301	AN6558F	Playback Amp.
IC302	SVIUPD4066BC	Playback/Rec/ Dolby/ Selector
IC401	AN6262	TPS
IC402	SVITC9310N11	Logic Control
IC403	SVIM54530P	Plunger, Motor Drive
IC404	AN6252	Tape Selector
IC405,406	AN6882	Level Comprator
IC407	DN6838	Hall Element
IC501	AN6558F	EQ Amp.
IC502	SVINJ4558DSM	Mix Amp.
IC601	SVIK4131-2M	Power Amp.
IC602	AN7072N	Muting
IC701	SVIM5230L	Regulator
TRANSISTORS		
Q81～84,207 301～305,314 401,403,404,406 407,408,411,501	2SC1815-Y	Muting,Rec Amp., Tuning Ind.Drive, ALC DCAmp.Rec Signal Amp., Playback/Rec Selector Discharge of ALC,Switching, Mic Amp.
Q201	2SK359	FM RF Amp.
Q202 Ⓢ	2SC1674-M	Mix
Q203 Ⓢ	2SC1675-L	OSC
Q206 Ⓢ	2SC1685-Q	Rec Out
Q300 Ⓢ	2SC1583F	ALC
Q306～308	2SC1845	Switching
Q309,310,312 313 Ⓢ	2SC1684-Q	Switching
Q311 Ⓢ	2SA564AR	Switching
Q402,405,410 412,413,502	2SA1015-Y	Muting,Switching
Q409 Ⓢ	2SC1384Q	Bias Osc
Q601,602	2SA992	Over Load Det.
Q603	2SA1015-Y	Therma/ Protector
Q701	2SD1273-Q	Regulator
Q702	2SD762-O	Regulator
DIODES		
D201 Ⓢ	1S2687AA	AFC
D202,302	SVDMC921	
D203,402,407～410, 510,601,602, 710,715 Ⓢ	MA162A	Switching.
D204,713 Ⓢ	SVDRD8.2EB	8.2V,Zemer
D205 Ⓢ	SVDMA26-2	
D301	SVDMC911	
D401	MA27W-A	
D403	MA1051H	5.1V Zener
D404	SVDPR3432S-9	LED,REC(Red)
D405	SVDBG3432S-9	LED,Play(Green)
D406	SVDAY3432S-9	LED,Pause (Yellow)
D410～419	LN419YCPH	LED,Level
D420～423	LN819RCPH	LED,Level
D424	LN81RCPH	LED,Tuning
D425	LN41YCPH	LED,Stereo
D510～514	SVDAY5735S	LED,Input
D701～704 ⚠	SVDS2V20	Rectifier
D705～709 ⚠	SVD1SR35200F	Rectifier
D714	MA1056M	5.6V,Zener
COILS		
L201	SLA4N39	FM Antenna
L202	SLD4P71-P	FM Det.
L203	RLQY25S5-0	Choke
L204	SL04P137-P	FM OSC
L205	SLA2C9-P	AM Antenna
L206	SL02C33-P	AM OSC
L207,208	SLMIZ31-P	LPF
L209	SLM1C69-P	LPF
L210,211 212～215	SLQZ12G1-D	Choke
L216	SLQY15G5-0	Choke
L301,302	SLM1Z31-P	LPF
L303,304	SLM1C73	Bias Trap
L401	SL09C1	Bias OSC
L402,701	SLQX181-1D	Choke

Ref. No.	Part No.	Description
COILS		
L403,404	SLQX242-1M	Choke
L501～504	ELQS181KB	Choke
L601,602	SLQY07G-30	Choke
L611～614	SLQY15G-10	Choke
L700,701 ⚠	SLQX400-D	Choke
TRANSFORMERS		
T1 ⚠	SLT5M295	Power Source
T201	SLI4C109	FM IFT
T202	SLI4C535-Z	FM IFT
T203	SLI4C537-Z	FM IFT
T204	SLI2C139-M	AM IFT
CERAMIC FILTERS		
CF201	SVFE107MS2-A	10.7MHZ(Red)
	SVFE107MS2-B	10.675MHZ (Blue)
	SVFE107MS2-C	10.725MHz (Orange)
	SVFE107MS2-D	10.65MHz (Black)
	SVFE107MS2-E	10.75MHz (White)
CF202	SVFE107MM-A	10.7MHz(Red)
	SVFE107MM-B	10.67MHz(Blue)
	SVFE107MM-C	10.73MHz (Orange)
	SVFE107MM-D	10.64MHz (Black)
	SVFE107MM-E	10.76MHz (White)
	(Use pair ranks as same as CF201 and CF202)	
CF203	SUFSFU450B3	AM 450kHz
VARIABLE CAPACITORS		
CT202	ECRHA010A11	Trimer,FM OSC
CV201～204 (CT201,203,204)	SVCCB41EX113	Tuning,FM/AM
VARIABLE RESISTORS		
VR201	EVN75AA00B53	VCO Adj.,5kΩ(B)
VR202	EVN58AA00B55	Sparation Adj., 500kΩ(B)
VR203	EVNK6AA00B23	Stereo Ind. Light up Level,2kΩ(B)
VR301,302	EVN58AA00B24	Playback Gain Adj.,20kΩ(B)
VR303,304	EVN58AA00B54	Rec Current Adj., 50kΩ(B)
VR401,402	EVN58AA00B15	Rec Bias Adj., 100kΩ(B)
VR501	EVU9RAF20G15	Mixing, 100kΩ(G)
VR502	EWCSTAF20A15	Volume,100kΩ(A)
VR503	EVU9KAF20G15	Balance,100kΩ(G)
COMPONENT COMBINATIONS		
Z201,202	EXRP122K473C	0.0012μF,47kΩ
Z401	EXFP6103ZW	0.01μF(X6)
Z501	EXBS88103K	10kΩ(X8)
THERMAL DETECTOR		
PS601	SRPBB47101	100℃(212°F)
IC PROTECTOR		
ICP401	QRUF10WH	0.2Ω,400mA
LAMPS		
PL1	XAMS2S200	Dial Point Ind., (6.3V,0.1A)
PL2	XAMSIS250C	Power on Ind., (6.3V,0.1A)
FUSES		
F1 ⚠	XBA2C08TRO	250V,T800mA
F3 ⚠	XBA2C12TRO	250V,T1.25A
SWITCHES		
S201,601～603	SSH467	FM Muting/ Mode.High Cut, HighBoost, LowBoost
S401～407	SSG13	Rec,Rew,FF, Play,Stop,Pause, Rec Mute
S408	SSS73	Tope Selector
S409	SSS71	Dolby NR
S410	SSS75	Timer
S411	SSP35	Eject
S412	SMQ4150	Rec Inhigit
S501～505	SSH553	Input Selector
S701 ⚠	SSH1071	Power Source.

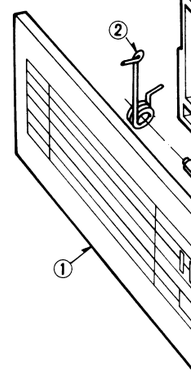
Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓞ-marked parts are are used for silver type only. Ⓡ-marked parts are used for red type only. Ⓦ-marked parts are used for white type only.
4. Part other than Ⓞ, Ⓡ and Ⓦ-marked are used for all types.
5. The "Ⓢ" mark is service standard parts and may differ from production parts.
6. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1 Ⓞ	SGXAK6SN	Panel(Silver),Cassete (1)
1 Ⓡ	SGXAK6RN	Panel(Red)Cassete (1)
1 Ⓦ	SGXAK6WE	Panel(White),Cassete (1)
2	SMQ6037	Spring,Cassete Holder (1)
3	SYE1025	Holder,Casset (1)
4	SMQ6021-1	Spring Cassete Holder (2)
5	SBC577	Button,Tape Counter (1)
6	SGE677	Label,Ornament (1)
7	SGK1761	Ornament (1)
8	SBC567	Button,Cassete (1)
9	SBC573	Button,Input Selector (1)
10	SUS191-2	Spring,Input Selector (5)
11	SBN1171	Button Knob,Mixing (2)
12	SBN1083	Knob,Volume (1)
13	SBN1081	Knob,Tuning (1)
14 Ⓞ	SGWAK6-SG	Front Panel,Ass'y(Silver) (1)
14 Ⓡ	SGWAK6-RG	Front Panel,Ass'y(Red) (1)
14 Ⓦ	SGWAK6-WG	Front Panel,Ass'y(White) (1)
15	SHR9659-1	Holder,Input Selector Button (5)
16	QDG1102	Gear,Slow UP (2)
17	SMQ1011	Bracket,Cassete (1)
18	SMQ2019	Tape Counter (1)
19	SMQ2021	Belt,Tape Counter (1)
20	SMQ3053	Bracket,Cassete (1)
21	SJT231	Terminal (2)
22	SMQ4003-1	Lever,Eject (1)
23	SMQ3051-1	Bracket,Cassete (1)
24	SMQ3057-1	Bracket,Cassete (1)
25	SMQ6029	Spring,Eject Lever (1)
26	SMQ6035	Spring,Eject Bracket (1)
27	SGK6035	Speacer,Switch (2)
28	SBC575	Button,Eject (1)
29	SJJ63E	Jack,Headphone (1)
30	SUB153	Connection Rod,Power Switch (1)
31	SBC425-1	Button,Power Switch (1)
32	SDR33-1	Roller,Dial Cord (7)
33	SDP1185	Pointer,Dial (1)
34	SDD37-1	Drum,Dial (1)
35	SDSA4121	Spring,Drum (1)

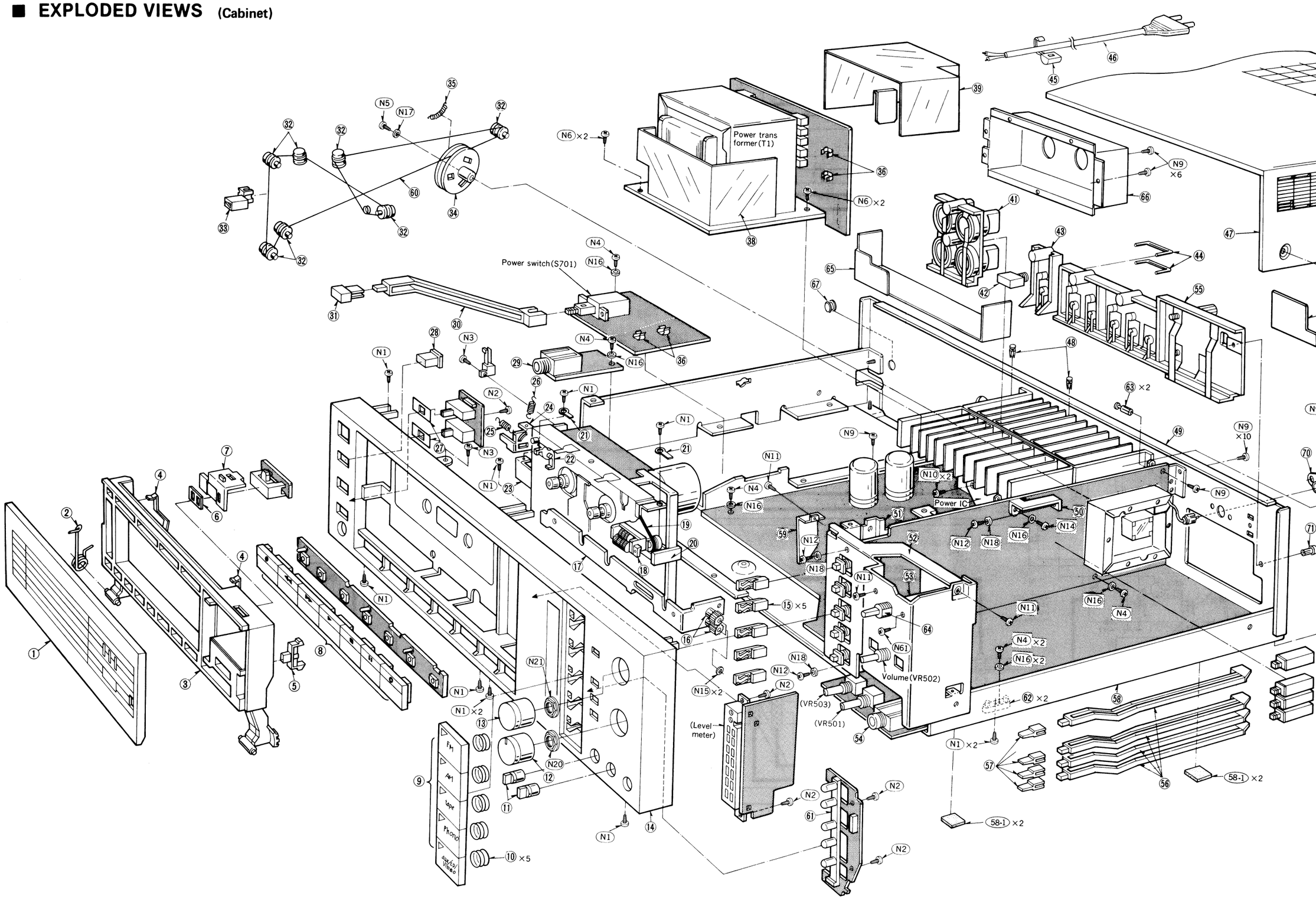
Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
36	SJT347	Holder,Fuse (6)
38	SMC1111	Cover,Power Transformer (1)
39	SMX773-1	Insulation Plate (1)
41	SJF4431-1	Terminal Board,Speaker (1)
42	SJJ73AK	Jack,Syncro Rec (1)
43	SJF3247-1N	Terminal Board (1)
44	SJP9205-2	Short Pin (2)
45	SHR127	Bushing,AC Cord (1)
46 ⚠	SJA138-3	AC Cord (1)
47 Ⓞ	SKC1410S2	Cabinet(Silver) (1)
47 Ⓡ	SKC1410R2	Cabinet(Red) (1)
47 Ⓦ	SKC1410W2	Cabinet(White) (1)
48	SHR411	Lock Pin (2)
49	SGP3690-6A	Rear Panel (1)
50	SMN1887	Bracket (1)
51	SUG83-3	Bracket (1)
52	SMN1869-1	Bracket (1)
53	SDT8107	Tuning Shaft (1)
54	SJJ63F	Jack.Mic (1)
55	SJF8031-7N	Terminal Boad (1)
56	SUB163	Connection Rod (4)
57	SBC571	Button,Switch (4)
58	SKUAK6-SG	Bottom Board (1)
58-1	(SHS2481	Foot (4)
59	SHR5257	Cover (1)
60	SDZ051-2	Cord,Dial (1.3m)
61	SHR9663	Holder,LED (1)
62	SHE73	Spacer (2)
63	SHR415	Lock Pin (2)
64	SNE2099	Bracket,Tuning Shaft (1)
65	SMX789	Insulation Plate (2)
66	SGP3830	Rear Panel (1)
67	RHR110	Bushing (1)
68	SGK1795	Label(Terminal Board) (1)
69	SMC1103	Cover (1)
70	SJP9105	Socket (1)
71	SHR401-1	Look Pin (1)
72	SMC1105	Cover (1)
73	RJT202B	Terminal (1)
SCREWS		
N1 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (17)
N2 Ⓢ	XTV3+10BFN	Tapping,⊕3×10 (5)

Ref. No.	Part No.	Description
SCREWS		
N3 Ⓢ	XTN26+6B	Tapping,⊕2.6×6 (2)
N4 Ⓢ	XTN3+8B	Tapping,⊕3×8 (7)
N5 Ⓢ	XSN26+5	⊕2.6×5 (1)
N6 Ⓢ	XTB4+8BFZ	Tapping,⊕4×8 (4)
N7 ⓈⓄⓌ	XTB3+8BFN	Tapping,⊕3×8 (2)
N7 ⓈⓇ	XTB3+8BFZ	Tapping,⊕3×8 (2)
N8 ⓄⓌ	SNE2095-2	Tapping(Silver) (4)
N8 Ⓡ	SNE2095-3	Tapping(Black) (4)
N9	XTBS3+8BFZ1	Tapping,with Detent, ⊕3×8 (28)
N10 Ⓢ	XTB3+16BFN	Tapping,⊕3×16 (2)
N11 Ⓢ	XTB3+8BFZ	Tapping,⊕3×8 (4)
N12 Ⓢ	XSN3+6S	⊕3×6 (3)
WASHERS		
N15	SHW41K20	Slow up Gear (2)
N16 Ⓢ	XWG3	Plain,φ3 (7)
N17 Ⓢ	XWA26B	Spring,φ2.6 (1)
N18 Ⓢ	XWA3B	Spring,φ3 (3)
NUTS		
N20	SNE4021	Volume (1)
N21	SNE4045	Tuning Shaft (1)
ACCESSORIES		
A1	SJP2189	Cord (1)
A2	SSA901	FM Feeder Antenna (1)
A3	SSA611-1	Loop Antenna (1)
A4	SMA231	HolderB,Loop Antenna (1)
A5	SMA233-1	HolderA,Loop Antenna (1)
A6	XTN3+10AFZ	Screw,Loop Antenna (2) Holder
A7	SQF11841	Instruction Book. (1)
PACKING PARTS		
P1 Ⓞ	SPP723	Polythylene Bag (1)
P1 ⓇⓌ	SPP721	Polyethylene Bag (1)
P2	SPS3997	Pad,Front Side (1)
P3	SPS3999-3	Rad,Rear Side (1)
P4	SPG4539	Carton Box (1)
P5 Ⓞonly	SGK1411	Lebel (2)
P5 Ⓡonly	SGK1473	Lebel (2)
P5 Ⓦonly	SGK1473-2	Lebel (2)

■ EXPLOD



■ EXPLODED VIEWS (Cabinet)



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